406.

SUPREME COURT OF THE UNITED STATES.

No. 138.

HORACE C. SILSBY, WASHBURN RACE, ABEL DOWNS, HENRY HENION, AND CHARLES D. THOMPSON, PLAINTIFFS IN ERROR,

vs.

ELISHA FOOTE.

IN ERROR TO THE CIRCUIT COURT, UNITED STATES, FOR THE NORTHERN DISTRICT OF NEW YORK.

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GIDEON, print.

UNITED STATES OF AMERICA, *ss:*

The President of the United States of America, to the judges of the circuit court of the United States, for the second circuit and northern district of New York, greeting:

Because in the record and proceedings, as also in the rendition of a judgment in a plea, which is in the said circuit court before you, between Elisha Foote, plaintiff, and Horace C. Silsby, Washburn Race, Abel Downs, Henry Henion, and Charles D. Thompson, defendants, which judgment was rendered in the said circuit court, on the 4th day of August, 1848, in favor of the said plaintiff against the said defendants, for the sum of one thousand eight hundred and twenty-four dollars and seventy-three cents, manifest error hath happened to the great damage of the said defendants, as by their complaint appears; and it being fit that the error, if any there hath been, should be duly corrected, and full and speedy justice done to the parties aforesaid in this behalf, you are hereby commanded, if judgment be therein given, that then, under your seal, distinctly and openly, you send the record and proceedings aforesaid, with all things concerning the same, to the Supreme Court of the United States, together with this writ, so that you have the same at Washington on the first Monday of December next, in the said Supreme Court to be then and there held; that the record and proceedings aforesaid being inspected, the said Supreme Court may cause further to be done therein to correct that error, what of right and according to the law and custom of the United States should be done.

Witness the honorable Roger B. Taney, chief justice of the said Supreme Court of the United States, the first Monday of December, in the year of our Lord one thousand eight hundred and forty-nine, and of the independence of the United States the seventy-fifth.

A. A. BOYCE, *Clerk.*

June 15, 1850.

The within writ of error allowed specially under the act of Congress of 1836, commonly called the Patent act.

S. NELSON.

UNITED STATES OF AMERICA, *ss:*

To Elisha Foote, greeting:

You are hereby cited and admonished to be and appear at a Supreme Court of the United States, to be holden at Washington on the first Monday in December next, pursuant to a writ of error filed in the clerk's office of the circuit court of the United States, for the second circuit and northern district of New York, wherein Horace C. Silsby, Wash-

burn Race, Abel Downs, Henry Henion, and Charles D. Thompson, are plaintiffs in error, and you are defendant in error, and show cause, if any there be, why the judgment in the said writ of error mentioned (and which judgment was recovered in the said circuit court in your favor against the said plaintiffs in error, on the fourth day of August, 1848, for the sum of one thousand eight hundred and twenty-four dollars and seventy-three cents, damages and costs) should not be corrected, and speedy justice should not be done to the parties in that behalf.

Witness the honorable Roger B. Taney, chief justice of the said Supreme Court of the United States, this 15th day of June, in the year of our Lord 1850.

S. NELSON.

I admit personal service, reserving all exceptions, this 5th day of July, 1850, of a copy of the above citation.

ELISHA FOOTE,
Defendant in error.

fol. 1. CIRCUIT COURT OF THE UNITED STATES,
Northern district of New York.

ELISHA FOOTE
vs.
HORACE C. SILSBY, Abel Downs, Washburn Race, Henry Henion, and Charles D. Thompson.

UNITED STATES OF AMERICA,
Northern district of New York, ss:

I, Augustus A. Boyce, clerk of the circuit court of the United States of America, in and for the northern district of New York, in the second circuit, do hereby certify, to the Supreme Court of the United States, that the judgment, record, and bill of exceptions, and proceedings, hereunto annexed, are true transcripts of the original remain-
fol. 2. ing on the files of my office in the above entitled cause.

In testimony whereof I have hereunto subscribed my name, and affixed the seal of the said circuit court, this first day of November, in the year of our Lord eighteen hundred and
[SEAL.] fifty, and of the independence of the said United States the seventy-fifth.

AUG. A. BOYCE, *Clerk.*

CIRCUIT COURT, UNITED STATES.

Pleas before the judges of the circuit court of the United States, for the 2d circuit and northern district of New York, at the City Hall, in the city of Albany, of the term of October, in the year 1846.

Witness Roger B. Taney, esq., chief justice.
fol. 3.

ANSON LITTLE, *Clerk.*

NORTHERN DISTRICT OF NEW YORK, *to wit:*

Be it remembered, that on the first day of March, in this same term of October, before the judges of the circuit court of the United States, for the 2d circuit and northern district of New York, at the City Hall, in the city of Albany, comes Elisha Foote, in proper person, and brings into the said court, before the aforesaid judges thereof now here, according to the statute in such case made and provided, his certain declaration against Horace C. Silsby, Abel Downs, Wash-
fol. 4. burn Race, Henry Henion, and Charles D. Thompson, of a plea of trespass on the case; which said declaration follows in these words, that is to say:

NORTHERN DISTRICT OF NEW YORK, *ss:*

Elisha Foote, plaintiff in this suit, in proper person, commences his suit by the filing and service of a declaration, according to the statute in such case made and provided, and the rules and practices of this court, and complains of Horace C. Silsby, Charles D. Thompson, Washburn Race, Abel Downs, and Henry Henion, defendants in this suit,
fol. 5. of a plea of trespass on the case. For that the plaintiff was the original and first inventor of a certain new and useful improvement in the letters patent, hereinafter mentioned, and fully described; the same being a new and useful improvement in regulating the draft of stoves, which was not known or used before his said invention, and which was not, at the time of his application for a patent, as hereinafter mentioned, in public use or on sale with his consent or allowance; and the plaintiff being so as aforesaid the inventor thereof, and being also a citizen of the United States, on the 26th
fol. 6. day of May, in the year 1842, upon due application therefor, did obtain certain letters patent therefor, in due form of law, under the seal of the Patent office of the United States, signed by the acting Secretary of State, and countersigned by the Commissioner of Patents of the United States, bearing date the day and year aforesaid, whereby there was secured to him, his administrators or assigns, for the term of 14 years, from and after the date of the patent, the full and exclusive right and liberty of making, using, and vending to
fol. 7. others to be used, the said improvements, as by the said letters patent, which the plaintiff brings here into court, will fully appear.

And the plaintiff further says, that from the time of the granting to him of the said letters patent hitherto, he has made, used, and vended to others to be used, the said improvement, to his great advantage and profit. Yet the said defendants, well knowing the premises, but contriving to injure the plaintiff, did, on the first day of January, in the year 1847, and at divers times before and afterwards, during
fol. 8. the said term of 14 years, mentioned in said letters patent, and before the commencement of this suit, at Seneca Falls, in the county of Seneca, and in the said northern district of the State of New York, unlawfully and wrongfully, and without the consent or al-

lowance, and against the will of the plaintiff, did make, use, and vend to others to be used, the said improvement, in violation and infringement of the exclusive right so secured to the plaintiff by said letters patent as aforesaid, and contrary to the form of the statute
fol. 9. of the United States in such case made and provided, whereby the plaintiff has been greatly injured, and deprived of great profits and advantages which he might, and otherwise would, have derived from said invention, and has sustained actual damages to the amount of ten thousand dollars; and by force of the statutes aforesaid an action has accrued to him to him to recover the said actual damages, and such additional amount, not exceeding in the whole three times the amount of such actual damages, as the court may see fit to order and adjudge. Yet the said defendants, though requested,
fol. 10. have never paid the same, or any part thereof, to the plaintiff, but have refused, and yet do refuse, so to do.

And the said plaintiff further says, that he being such inventor, and citizen of the United States, and the said letters patent having been so obtained as aforesaid, and the said invention having been so made, used, and vended to others to be used, by the said plaintiff; and the said defendants well knowing the premises, but further contriving and intending as aforesaid, after the obtaining of the said letters patent, and within the said term of years in said letters patent mentioned,
fol. 11. to wit, on the first day of January, in the year 1844, and on divers other times and days between that day and the day of commencing this suit in the United States [court] aforesaid, to wit, at Seneca Falls aforesaid, unlawfully and unjustly, without the leave or license, and against the will of the said plaintiff, made divers, to wit, five thousand regulators for stoves, on the said improved plan, and in imitation of the said invention of the said plaintiff, in violation and infringement of the exclusive rights so secured to the plaintiff
fol. 12. by the said letters patent as aforesaid, and contrary to the form of the statutes in such case made and provided, whereby the plaintiff has been greatly injured, and has sustained actual damages to the amount of ten thousand dollars; and by force of the statutes aforesaid an action has accrued to him to recover the said actual damages, and such additional amount as the court may see fit to order and adjudge.

And the said plaintiff further says, that he being such inventor and citizen of the United States, and the said letters patent having been so obtained as aforesaid, and the said invention having been
fol. 13. so made, used, and vended to others to be used, by the said plaintiff, as aforesaid; and the said defendants well knowing the premises, but further contriving and intending, as aforesaid, after the obtaining of the said letters patent, and within the said term of years in said letters patent mentioned, to wit, on the first day of January, in the year 1844, and on divers other days and times between that day and the day of commencing this suit, in the United States, to wit, at Seneca falls aforesaid, unlawfully and unjustly, without the

fol. 14. leave or license, and against the will of the said plaintiff, vended to others to be used, divers, to wit, five thousand regulators for stoves, on the said improved plan, and in imitation of the said invention of the said plaintiff, in violation and infringement of the exclusive right so secured to the plaintiff by said letters patent as aforesaid, and contrary to the form of the statute in such case made and provided, whereby the plaintiff has been greatly injured, and has lost the sale of a large quantity, to wit, five thousand regulators
fol. 15. for stoves, and has been deprived of large profits arising from the sale and assignment of the right secured by the said letters patent to others, and other profits and advantages which he might and otherwise would have derived from the said invention, and has sustained actual damages to the amount of ten thousand dollars; and by force of the statute aforesaid an action has accrued to him to recover the said actual damages, and such additional amount, not exceeding in the whole three times the amount of such actual damages, as the court may see fit to order and adjudge; yet the said defendants,
fol. 16. though requested, have never paid the same, or any part thereof, to the plaintiff, but have refused, and yet do refuse, so to do.

And the said Horace C. Silsby, Charles D. Thompson, Washburn Race, Abel Downs, and Henry Henion, by William A. Sacket, their attorney, come and defend the wrong and injury, when, &c., and say they are not guilty of the premises laid to their charge, or any or either of them, or any part thereof, in manner and form aforesaid, as the said plaintiff has above thereof complained against them; and of
fol. 17. this they put themselves upon the country, and the said plaintiff does the like, &c.

And hereupon the process thereof is continued between the parties aforesaid, of the form aforesaid, in this same court, before the judges thereof, until the Tuesday after the third Monday of June, of the term of June, in the year 1848, at the court-house in the village of Canandaigua; and the same day is given to the parties aforesaid at the same place.

Therefore, to try the issue above joined, let a jury thereupon come before the judges of this same court, by whom, &c.; at which
fol. 18. said last mentioned day, before the said judges at the place last aforesaid come the parties aforesaid, by their respective attorneys aforesaid, and thereupon the jurors of the jury summoned to try the said issue being called also come, who, to speak the truth of the matters within contained, being chosen, tried, and sworn, say, upon their oaths, that the said defendants are guilty of the premises above laid to their charge in manner and form as the said plaintiff hath above complained against them; and they assess the damages of the
fol. 20. said plaintiff, by reason of the premises, over and above his costs and charges by him about his suit in this behalf expended, to one thousand and five hundred dollars, and for those costs and damages to six cents.

Therefore it is considered that the said plaintiff do recover against the said defendants his damages, costs, and charges by the jurors aforesaid in form aforesaid assessed, and also three hundred and twenty-four dollars and seventy-three cents for his said costs and charges by the said court now here adjudged of increase to the said plaintiff, and with his assent; which said damages, costs, and charges, in the
fol. 20. whole, amount to eighteen hundred [and] twenty-four dollars and seventy-three cents. And the said defendants, in mercy, &c.

Filed August 4, 1848.

Judgment signed this 4th day of August, 1848.

ANSON LITTLE, *Clerk.*

CIRCUIT COURT OF THE UNITED STATES,
For the northern district of New York.

HORACE C. SILSBY, Washburn Race, Abel Downs, Henry Henion, and Charles D. Thompson, ads. ELISHA FOOTE.

NORTHERN DISTRICT OF NEW YORK, *ss:*

Be it remembered, that, in October term, to wit, the first day of March, in the same term of October, in the year 1846, came
fol. 21. Elisha Foote, in proper person, into the circuit court of the United States, for the northern district of New York, before the judges thereof, and impleaded Horace C. Silsby, Washburn Race, Abel Downs, Henry Henion, and Charles D. Thompson, in a certain plea of trespass on the case, in which the said plaintiff declared against the said defendants in these words:

Circuit court of the United States, for the second circuit and northern district of New York.

fol. 22. October term, to wit: The first day of March, in the same term of October, in the year 1846.

NORTHERN DISTRICT OF NEW YORK, *ss:*

Elisha Foote, plaintiff in this suit, in proper person, commences this suit by the filing and service of a declaration according to the form of the statute in such case made and provided, and the rules and practice of this court; and complains of Horace C. Silsby, Charles D. Thompson, Washburn Race, Abel Downs, and Henry Henion, defendants in this suit, in a plea of trespass on the case, for that the plaintiff
fol. 23. was the original and first inventor of a certain new and useful improvement in the letters patent hereinafter mentioned and fully described; the same being a new and useful improvement in regulating the draft of stoves, which was not known or used before his said invention; and which was not at the time of his application for a patent, as hereinafter mentioned, in public use, or on sale, with his

consent or allowance; and the plaintiff being so as aforesaid the inventor thereof, and being a citizen of the United States, on the
fol. 24. 26th day of May, in the year, 1842, upon due application therefor, did obtain certain letters patent therefor in due form of law under seal of the Patent office of the United States, signed by the acting Secretary of State, and countersigned by the Commissioner of Patents, bearing date the day and year aforesaid; whereby there was secured to him, his heirs, administrators, or assigns, for the term of fourteen years, from and after the date of the patent, the full and exclusive right and liberty of using, and vending to others to be used,
fol. 25. the said improvement, as by the said letters patent, which the plaintiff brings here into court, will fully appear.

And the plaintiff further says, that, from the time of the granting to him of the said letters patent hitherto, he has made, used, and vended to others to be used, the said improvement to his great advantage and profit; yet the said defendants, well knowing the premises, but contriving to injure the plaintiff, did, on the first day of January, in the year 1847, and at divers times before and afterwards, during the said term of fourteen years mentioned in said letters patent, and before
fol. 26. the commencement of this suit, at Seneca Falls, in the county of Seneca, and in said northern district of the State of New York, unlawfully and wrongfully, and without the consent or allowance, and against the will of the plaintiff, make, use, and vend to others to be used, the said improvement, in violation and infringement of the exclusive right so secured to the plaintiff by said letters patent as aforesaid, and contrary to the form of the statutes of the United States in such case made and provided, whereby the plaintiff has been greatly
fol. 27. injured, and deprived of great profits and advantage which he might, and otherwise would, have derived from said invention, and has sustained actual damages to the amount of ten thousand dollars; and, by force of the statutes aforesaid, an action has accrued to him to recover the said actual damages, and such additional amount, not exceeding in the whole three times the amount of such actual damages, as the court may see fit to order and adjudge; yet the said defendants, though requested, have never paid the same or any part thereof to the plaintiff, but have refused, and yet do refuse, so to do.

fol. 28. And the said plaintiff further says, that he, being such inventor and citizen of the United States, and the said letters patent having been so obtained as aforesaid, and the said invention being so made, used, and vended to others to be used, by the said plaintiff; and the said defendants, well knowing the premises, but further contriving and intending as aforesaid after the obtaining of the said letters patent, and within the said term of years in said letters
fol. 29. patent mentioned, to wit, on the first day of January, in the year 1844, and on divers other times and days between that day and the day of commencing this suit in the United States aforesaid, to wit, at Seneca Falls, aforesaid, unlawfully and unjustly, and without the leave or license, and against the will, of the said plaintiff, made divers, to wit, five thousand regulators for stoves, on the said

improved plan and in imitation of the said invention of the said plaintiff, in violation and infringement of the exclusive right so secured to the plaintiff by said letters patent as aforesaid, and contrary to the form of the statutes in such case made and provided, whereby the
fol. 30. plaintiff has been greatly injured, and has sustained actual damages to the amount of five thousand dollars; and, by force of the statutes aforesaid, an action hath accrued to him to recover the said actual damages and such additional amount as the court may see fit to order and adjudge.

And the said plaintiff further says, that he, being such inventor and citizen of the United States, and the said letters patent having been so obtained as aforesaid, and the said invention having been so made, used, and vended to others to be used, by the said plaintiff as
fol. 31. aforesaid; and the said defendants, well knowing the premises, but further contriving and intending as aforesaid, after the obtaining the said letters patent, and within the said term of years in said letters patent mentioned, to wit, on the first day of January, in the year 1844, and at divers other days and times between that day and the day of commencing this suit in the United States, to wit, at Seneca Falls, aforesaid, unlawfully and unjustly, without the leave or license, and against the will of the said plaintiff, vended to others to be used
fol. 32. divers, to wit, five thousand regulators for stoves on the said improved plan and in imitation of the said invention of the said plaintiff, in violation and infringement of the exclusive right secured to the plaintiff by said letters patent as aforesaid, and contrary to the form of the statute in such case made and provided, whereby the plaintiff has been greatly injured, and has lost the sale of a large quantity, to wit, five thousand regulators for stoves, and has been deprived of large profits arising from the sale and assignment of the right secured by said letters patent to others, and other profits and advantages which he might, and otherwise would, have derived from the
fol. 33. said invention, and has sustained actual damages to the amount of ten thousand dollars; and, by force of the statutes aforesaid, an action has accrued to him to recover the said actual damages, and such additional amount, not exceeding in the whole three times the amount of such actual damages, as the court may see fit to order and adjudge.

Yet the said defendants, though requested, have never paid the same, or any part thereof, to the plaintiff, but have refused and yet do refuse, so to do.

To which said declaration the said defendants, by William
fol. 34. A. Sackett, their attorney, pleaded in these words:

The said Horace C. Silsby, Charles D. Thompson, Washburn Race, Abel Downs, and Henry Henion, by William A. Sackett, their attorney, come and defend the wrong and injury, when, &c., and say that they are not guilty of the premises laid to their charge, or any or either of them, or any part thereof, in manner and form aforesaid, as the said plaintiff has above hereof complained against

them, and of this they put themselves upon the country, and the said plaintiff does the like, &c.

fol. 35. And for a further plea in this behalf the said defendants, by leave of the court here for this purpose first had and obtained, according to the form of the statute in such case made and provided, say that the said plaintiff ought not to have or maintain his aforesaid action thereof against them, because they say that the said Elisha Foote, in the said declaration mentioned, was not the original and first inventor of the said new and useful machine described in the letters patent mentioned and referred to in the said declaration

fol. 36. in manner and form as the said plaintiff hath above in that behalf alleged; and of this the said defendants put themselves upon the country, &c.

And for a further plea in this behalf the said defendants, by like leave of the court here for this purpose first had and obtained, according to the form of the statute in such case made and provided, say that the said plaintiff ought not to have or maintain his aforesaid action thereof against them, because they say that the said supposed invention was not, at the time of making and granting the said letters

fol. 37. patent, a new invention, but, on the contrary, substantial parts thereof had been known and used in divers places, to wit, in the States of New York, New Jersey, Massachusetts, Connecticut, Pennsylvania, Vermont, Maryland, Mississippi, New Hampshire, North Carolina, Delaware, and in the District of Columbia, and within that part of the united kingdom of Great Britain called England, and in France, and were described in divers public works, to wit, the "Edinburgh Encyclopedia," the "Journal of the Franklin Institute," Register of Arts and Journal of Patent Inventions, "Repertory of Arts," "Rees' Cyclopedia," Dr. Brewster's "Journal of Science,"

fol. 38. and in "Ure's Dictionary of Arts, Manufactories, and Mines," and this the said defendants are ready to verify; wherefore they pray judgment if the said plaintiff ought to have or maintain his aforesaid action against them.

To these pleas was annexed, and with them was served, a notice in the words following, to wit:

Please to take notice, that the defendants at the trial of the above cause will insist upon, and give in evidence in bar of the plaintiff's right of action under the general issue above pleaded, according to the statute in such case made and provided, that the said plaintiff, pa-

fol. 39. tentee, &c., did not, before he received the said patent mentioned and referred to in the declaration in this cause, or at any time as required by law, deliver a written description of his invention or discovery so patented, and of the process or manner of making, constructing, using, and compounding the same in such full, clear, and exact terms, avoiding unnecessary prolixity, as to enable any person skilled in the arts or sciences to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the

same, signed by the said patentee and attested by two wit-
fol. 40. nesses, and file the same in the Patent office of the United States.

And you will further take notice, that the said defendants will give in evidence as aforesaid, that the said plaintiff, patentee as aforesaid, did not, before receiving his said patent, or at any time as required by law, deliver a written description and file the same in the Patent office of the United States, fully explaining the principle of the thing patented, and the several modes in which he had contemplated the application of that principle or character by which it may be distinguished from other inventions, the same being a machine requiring such
fol. 41. explanation; and particularly specify and point out the part, improvement, or combination he claims as his own invention or discovery, according to the statute in such case made and provided.

And you will further take notice, that the said defendants will give in evidence as aforesaid, that the said plaintiff, patentee as aforesaid, did not, before receiving said patent, or at any time, accompany the whole with a drawing or drawings, and written references, (the nature of the case admitting of drawings,) or with specimens of ingredients, and of the composition of matter sufficient in quantities for the
fol. 42. purpose of experiment, the invention or discovery being of a composition of matter; and that such descriptions and drawings, signed by the plaintiff, patentee, &c., attested by two witnesses, were not and are not filed in the Patent office of the United States, as required by statute.

And you will further take notice, that the said defendants will give in evidence as aforesaid, that the said plaintiff, patentee, &c., did not, nor has he furnished to the Patent office a model of his invention, (the same being a case which admits of representation by model,)
fol. 43. of a convenient size, to exhibit advantageously its several parts, as required by law.

And you will further take notice, that the said defendants will give in evidence as aforesaid, that the specification and description of the invention patented in and by the said patent, and what the said plaintiff claims as his own invention, on file in the Patent office of the United States, are in the words and figures following, viz:

To all whom it may concern.

Be it remembered that I, Elisha Foote, jun'r., of Seneca Falls, in the county of Seneca, and State of New York, have invented
fol. 44. a new and useful mode of regulating the heat of stoves, and other structures for fires, and I do here by declare that the following is a full and exact description.

My plan makes the stove, or other structure in which it may be used, regulate its own heat, and this is effected by applying the expansive and contracting power of a metallic rod by different degrees of heat to the damper of the stove, by which the admission of air thereto is gov-

erned; so that when the heat shall rise above any required de-
fol. 45. gree, the expansion shall close such damper; and when it shall fall below such degree, the contraction shall open it, and thus keep a uniform heat of the required intensity.

Considerable variety may exist in the mode of application, and it may be varied to suit particular circumstances. I have constructed two stoves, and applied the regulator as follows:

Figure 5 represents a common box stove, the front side of which is supposed to be removed; A B is a brass rod attached firmly at A, to the front of the stove by a shoulder on the inside, and a nut and
fol. 46. screw on the outside. It is not necessarily of brass, but the use of that metal will probably be found most practicable. It is best made by rolling sheet brass into a rod, so that it shall have two or three thicknesses, and be from one to three inches in diameter. The end at B is made flat, and rivetted to the short arm of the lever B C, so as to make a close joint therewith. B C is made of iron, and of sufficient strength to be inflexible. It turns on its fulcrum at D, which is made fast to the back of the stove by a nut and screw, and riveted to B C; C L is another brass rod similar in its construction to A
fol. 47. B, and attached to the long arm of B C in the same manner. The end at L projects through the front of the stove, and is attached by a rivet to another lever, E F; G K is the damper, by which the admission of air to the stove is governed. It is bent so that the hinge at G may stand out a little in front of the stove, and give room for the play of the stem F G. The hinge is made in the com-
fol. 28. mon form, and the stem is merely a projection or extension of the damper.

The end of the stem at F is made round, and fits into a hole made into the lever E F, so as to move easily therein. The lever E F should be of sufficient size and strength to be inflexible, and is attached to its fulcrum at E, by a rivet so as to make a joint therewith; H E is an iron rod, it is attached at H to the stove in any manner that will make it firm, and should either have a joint at H, or should be
fol. 49. flexible at that point, so that the end E, which constitutes the fulcrum to E F, may be raised or depressed. At I is a screw, the head of which is made fast to, but turns in the front plate of the stove; the thread of the screw passes through the rod H E, and by turning the screw, the end of the rod E may be raised or depressed at pleasure. It is manifest, that the expansion of the brass rods pressing against the lever E F, will close the damper, and their contrac-
fol. 50. tion will open it. If the fulcrum I be raised, it will require a greater degree of expansion, or in other words, a higher degree of heat to close the damper; if it be depressed, a lower degree will close it. A pointer, I O, is made fast to the head of the screw, so as to turn when the screw turns, and show how much the fulcrum E has been raised or depressed in a half revolution of the screw; and it having been found by experiment with a common thermometer how much the heat of the stove is raised or depressed by moving the pointer a given

fol. 51. distance, a scale is made and marked on the front plate of the stove, as at x o z, with as many different degrees of heat as it may be desired to vary the temperature of the stove; and the pointer being placed at any particular degree of heat, the stove will maintain the same with great accuracy; for, should the heat rise above the point, the expansion of the brass rods will close the damper and check it, or should it fall below the point, their contraction will open the damper and let in the full draft of air. It is desirable to make the
fol. 52. stove as nearly air tight as possible, and the door and damper should both closely fit; and I usually put into the stove more fuel than would be necessary in an open stove, and have the same constantly held in check by the damper.

The other, and more perfect, although more expensive mode of applying the regulator, is represented by figure 4, which is an external view of the stove, having the face or scale on which the different degrees of heat are marked, and the pointer at a, the damper
fol. 53. at B, and the door at C. Figures 1, 2, and 3, are different views of the machinery, in which the same letters represent the same parts in each. Figure 1 is a sectional view made through the front of the stove; figure 2 is a perspective view from the back; figure 3 a perspective view from the front of the stove. A, B, C, D, E, is a frame of cast iron, made to support the brass rods and other machinery, and to which they are attached. This stove is made of sheet iron, and a more substantial support than that would make for the rods
fol. 54. becomes necessary. In a cast iron stove, the frame could probably be dispensed with, suitable projections being cast upon the plate, to which to attach the machinery. The frame is made fast to the inside of the top of the stove, by screws passing through the top of the stove and entering the frame. The part A B, figures 2 and 3, is attached to the back part of the stove immediately under the flue. B C at one of the ends, and C D at the front, the whole of sufficient
fol. 55. strength to be inflexible. At A, a little projection or extra thickness is made, to which the brass rod F C, is firmly riveted; at K, another projection is made, which constitutes the fulcrum to the lever G H; a hole is made or left in the projection, through which the lever passes, and is held by a rivet so as to turn easily, and yet be perfectly firm. D E, figures 1, 2, and 3, is a projection of the frame extending down within one or two inches of the front of the stove; it is bored at L^2, and holds one end of the shaft L N, the other of which passes
fol. 56. through and is held by the front of the stove as seen in fig. 1st on L N, and at about the middle of it is a projection J P, fig. 1st, from one to three inches in length, with two prongs at the top, within which the brass rod I H is held by a pivot so as to make a close joint with it. The brass rods and the lever G H are made in the same way, and are attached to each other in the same manner, as is described in the stove first mentioned. The effect of the expansion
fol. 57. and contraction of the brass rods is to move the shaft L N back and forth by operating on the projection J P, and the

ends in which it rests in the frame, and in the front of the stove, are turned so as to permit it to move easily therein; attached to the shaft on the outside of the stove is the face Q R, on which the different degrees of heat are marked, seen also at fig. 4 at A. It is made solid with the shafts, or is firmly attached to and turns with it; the shaft
fol. 58. is made and bored hollow as represented in fig. 1st, so as to admit to pass through the centre of it the pivot O S, which is turned and made to fit and move easily within the shaft. At the end S is firmly attached the pointer T U, and at the end E is firmly attached the rod O o, which passing down the front side of the stove, and within the same, moves the damper when variations of heat change the lengths of the brass rods.

The face may be made of brass or any other material to
fol. 59. suit the taste of the maker.

It is usually made circular, having on the upper side the different degrees of heat found and marked as first described, and on the lower, corresponding with the different degrees, small holes into which a pin on the pointer at U may be inserted and connect the two. The pointer may be made of steel and polished. Passing through the lower end, is a screw at U, in fig. 1st, on the end of which is a small pin fitted to enter the holes on the face. On the other end of
fol. 60. the screw is a knob which serves as a handle to turn the pointer, or to unscrew and detach the pointer from the face. If attached, the brass rods affect and move the damper below; if detached, they have no effect upon it.

The damper is made in the common form of two plates moving one upon the other with orifices in each, so that in one position both shall be closed, and in another both opened.

The inside plate is represented by b c, seen wholly in fig. 2, and partly in fig. 3. It is made thicker in the centre, and is bored
fol. 61. through as is represented in fig. 1st, to admit and hold the stem to the outside plate. d e represents the outside plate, seen wholly in fig. 3 partly closed; at fig. g is its stem attached to its centre, and passing through the outside plate. The faces to both should be ground or turned as well as the stem, so as to move easily and closely one on the other; on the end of the stem at g, is made or firmly attached the projection g a, which ends in two prongs
fol. 62. as is shown in fig. 2; the end of the rod O a terminates as is seen at a in figs. 1 and 2, in a circular plate of from 1 to 2 inches in diameter, and fitted to move easily and closely within the two prongs to the stem of the damper. The object of this arrangement is, that if for instance the closing of the damper should fail to check the heat, the rod would be disconnected from the damper, and pass on without injury to the machinery; and when it returns it would catch the upper prong and connect itself again with the dam-
fol. 63. per; and should a high heat be desired, the damper may be set open, and the rod at some distance from it, so that it shall require a great degree of expansion before the rod would reach the

damper to close it; or should it be desired to change it from a high to a low degree of heat, the damper may be closed and the rod set so that a great contraction will have to take place before it will reach the damper to open it. The rod O a should have sufficient width and strength to be inflexible. The stove governs its heat the same as the
fol. 64. one first described.

What I claim as my invention, and desire to secure by letters patent, is the application of the expansive and contracting power of a metallic rod by different degrees of heat to open and close a damper, which governs the admission of air into a stove, or other structure in which it may be used, by which a more perfect control over the heat is obtained than can be by a damper in the flue.

I also claim as my invention the mode above described of setting the heat of the stove at any requisite degree, by which different
fol. 65. degrees of expansion are requisite to open or close the damper.

I also claim the combination above described, by which the regulation of the heat of a stove, or other structure in which it may be used, is effected; and I also claim as my invention the mode above described of connecting the action of the metallic rods with the damper so that the same may be disconnected when the damper shall have closed, and the heat shall continue to rise, &c.

ELISHA FOOTE, Jr.

Witnesses—Anson Atwood,
G. H. Goddard.

And that the said Elisha Foote, in and by a certain peti-
fol. 66. tion and disclaimer, now on file in the Patent office of the United States, filed on or about the 9th day of March, in the year 1847, of which the following is a copy, viz:

To the Commissioner of Patents:

The petition of Elisha Foote, of Seneca Falls, in the county of Seneca, and State of New York, respectfully represents:

That your petitioner obtained letters patent of the United States for an improvement in regulating the draught of stoves, which letters patent are dated on the 26th day of May, 1842. That he has
fol. 67. reason to believe that through inadvertence and mistake the claim made in the specification of said letters patent, in the following words, to wit:

What I claim as my invention and desire to secure by letters patent, is the application of the expansive and contractive power of a metallic rod, by different degrees of heat, to open and close a damper, which governs the admission of air into a stove, or other structure in which it may be used, by which a more perfect control over the heat is obtained than can be by a damper in the flue, is too broad, including
fol. 68. that of which your petitioner was not the first inventor.

Your petitioner, therefore, hereby enters his disclaimer to so much of said claim as extends the application of the expansive and contracting power of a metallic rod by different degrees of heat, to any other use or purpose than that of regulating the heat of a stove, in which such rod shall be acted upon directly by the heat of the stove or the fire which it contains; such disclaimer is to operate to the extent of the interest in said letters patent vested in your petitioner, who has
fol. 69. paid ten dollars into the Treasury of the United States, agreeably to the requirements of the act of Congress in that case made and provided. ELISHA FOOTE.

Witnesses:

MORRIS NEWTON,
EDWIN L. BORTHICK.

Disclaimed so much of said claim herein stated as extends the application of the expansive and contracting power of a metallic rod, by different degrees of heat, to any other use or purpose than that of regulating the heat of stoves, in which such rod shall be acted upon directly by the heat of the stove or the fire which it contains, as is
fol. 70. more particularly specified in the petition and disclaimer aforesaid.

And the said defendants aver and insist, that the said specification does not correctly and accurately describe the improvement claimed by said Elisha Foote as his invention. But said specification and the drawing thereto annexed are altogether defective in this, among other things, viz., in said specification no proportions, sizes, or distances are given, and the bigness or size of none of the principal parts of said machine is given, in said specification or drawings, but the name is wholly omitted.

And the said defendants aver, that the said specification,
fol. 71. annexed to and making a part of said letters patent, with the drawings thereto annexed, do not contain a written description of what the said Elisha Foote claims as his invention and improvement aforesaid, and of the manner and process of making, constructing, using, and compounding the same, in such full, clear, and exact terms, avoiding unnecessary prolixity, as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same, and fully explain the principle and the several modes in which said
fol. 72. patentee contemplated the application of that principle or character by which it may be distinguished from other inventions; and do not particularly specify and point out the part, improvements, or combination claimed by said patentee as his discovery.

That the said specification does not contain a sufficient description of a machine, by which the known expansive and contracting powers of a metallic rod by different degrees of heat is applied to close and open a damper, which governs the admission of air into a stove, in
fol. 73. which it may be used, by which a more perfect control over the heat is obtained than can be by a damper in the flue.

That said specification does not contain the whole truth relative to said invention or discovery; that it contains more than is necessary to produce the desired effect; which concealment and addition were made by the said patentee for the purpose of deceiving the public; that the patentee was not the original or first inventor or discoverer of the thing patented.

That the patentee was not the original and first inventor or discoverer of a substantial and material part thereof, claimed as
fol. 74. new. That it had been described in a public work, called "Ure's Dictionary of Arts, Manufactures, and Mines," anterior to the supposed invention thereof by the patentee; and also had been in public use and known before that time, and used by Andrew Ure, of London; the late M. Bonnemair, of Paris, and George H. McClary, of Seneca Falls, New York.

That the said plaintiff was not the original or first inventor or discoverer of the application of the expansive and contracting power of a metallic rod, by different degrees of heat, to open and close a
fol. 75. damper, which governs the admission of air into a stove or other structure, or into a stove in which it may be used, by which a more perfect control is obtained over the heat than can be by a damper in the flue.

That he was not the original or first inventor or discoverer of the application of the expansive and contracting power of a metallic rod, by different degrees of heat, to open and close a damper, which governs the admission of air into a stove or other structure, which the
fol. 76. said defendants aver is a substantial and material part of the said invention, claimed by the said patentee as new.

And you will further take notice, that the said defendants will prove, as aforesaid, that the part of said patent not disclaimed as aforesaid is not definitely distinguishable, and is not distinguished in the specification aforesaid, or in the patent aforesaid, or in the disclaimer aforesaid, from the other parts thereof, disclaimed as aforesaid.

On motion of the plaintiff, upon argument, at the October term, at Albany, in 1847, the 2 special pleas were, by order of the court, stricken out; and so the issue was left on the general issue only, with the notice.

And afterwards, to wit, at a term of the said court, held at
fol. 77. Canandaigua, in said northern district, on the 28th day of June, 1848, before his honor Alfred Conkling, judge of the district court of the United States, for the northern district of New York, and one of the judges of the said circuit court, the said cause came on to be tried, and was tried, by a jury.

The cause was opened on the part of the plaintiff by Mr. Henry B. Stanton, his counsel. After the learned counsel had addressed
fol. 78. the jury in opening the cause, one hour and twenty-five minutes, and before he had concluded his opening argument, Henry Bell, one of the jurors, who had been drawn from the regular panel, and had been duly empannelled and sworn before the commencement of the trial, became ill, and applied to the court to be discharged

from further serving in the cause. The juror was discharged by the court, and left the jury box. Thereupon, the court asked the counsel of the respective parties whether they would consent that
fol. 79. another juror be drawn from the regular panel, and substituted in the place of the said Henry Bell; the counsel for the plaintiff expressed their assent, and the counsel for the defendants declared their refusal to consent.

Thereupon, on the motion of the plaintiff's counsel, the court ordered another juror to be drawn to replace the said Henry Bell. The defendants' counsel objected to this proceeding as irregular and illegal. The court overruled the objection, and directed such other juror to be drawn, and the name of Hiram Harkness was then drawn
fol. 80. from the regular panel returned by the marshal, and he was duly sworn and took his seat as a juror.

The court then directed that the cause should proceed, the counsel for the defendants objected to the discharge of the said Henry Bell, and to the order of the court directing the said Hiram Harkness to be sworn as a juror, and to the order that the cause should proceed, and duly excepted to the said decisions of the court, and to each and every of them.

fol. 81. The said counsel for the plaintiff then concluded his opening argument.

The plaintiff's counsel then read in evidence letters patent to the plaintiff, dated May 26th, 1842, and the specification thereto annexed, and the drawings referred to in said specification; which letters patent were as set forth in the plaintiff's declaration, and which specification is herein before set forth, from folio 43 to folio 65. On the back of said letters patent was endorsed what purported to be a disclaimer with a
fol. 82. memorandum underneath, which disclaimer and memorandum were in the words following, to wit:

To the Commissioner of Patents.

The petition of Elisha Foote, of Seneca Falls, in the county of Seneca, and State of New York, respectfully represents:

That your petitioner obtained letters patent of the United States for an improvement in regulating the draught of stoves, which letters patent are dated on the 26th day of May, 1842. That he has reason to believe that, through inadvertence and mistake, the claim made in the specification of said letters patent, in the following words, to wit: "What I claim as my invention and desire to secure by letters patent,
fol. 83. is the application of the expansive and contracting power of a metallic rod, by different degrees of heat, to open and close a damper which governs the admission of air into a stove, or other structure in which it may be used, by which a more perfect control over the heat is obtained than can be by a damper in the flue," is too broad, including that of which your petitioner was not the first inventor.

Your petitioner, therefore, hereby enters his disclaimer to so much

of said claim as extends the application of the expansive and
fol. 84. contracting power of a metallic rod, by different degrees of heat, to any other use or purpose than that of regulating the heat of a stove, in which such rod shall be acted upon directly by the heat of the stove or the fire which it contains; such disclaimer is to operate to the extent of the interest in said letters patent vested in your petitioner, who has paid ten dollars into the treasury of the United States agreeably to the act of Congress in that case made and provided.

ELISHA FOOTE.

Witnesses—

MORRIS NEWTON,
fol. 85. EDWIN L. BALTINK.

(Endorsed on back of patent the 9th March, 1847.)

The plaintiff's counsel then proposed to read a duly certified copy of the above disclaimer and endorsement in evidence. The counsel for the defendants objected to the same being read in evidence, on the ground that the pretended disclaimer was void in law as a disclaimer, because the patentee did not state therein the extent of his interest in the patent.

The court sustained the objection, and decided that the said plain-
fol. 86. tiff's counsel should not read the said disclaimer in evidence. To this decision the plaintiff's counsel excepted.

J. W. Davison was then called, and sworn as a witness for the plaintiff, and then testified as follows: I know Elisha Foote. In the latter part of 1840, or during the winter of 1840 and 1841, Mr. Foote showed me a stove he had in use in his room; my attention was called to it by reason of its economy of fuel. Mr. Foote was boarding at Watkins. It was a box stove with six plates, separate plates. The apparatus was similar to this, (meaning a model here exhibited by the plaintiff's counsel;) there were rods passing through like this; the lever was
fol. 87. inside; Foote told me these rods were of brass; by opening the front door of the stove I could see the apparatus. I don't recollect the fastening of the rod in front. I remember the two rods and the lever on the back side. I remember something came down in front and took hold of the damper in front of the stove, and connected it with the brass rod; the damper was of sheet iron; Foote set the stove open to show that the damper would be shut by the operation of
fol. 88. the apparatus. It was metal that connected the brass rod with the damper. It shut itself up and opened itself, but not so much as the stoves since made. About a year afterwards Mr. Foote applied the apparatus to a sheet iron stove, that is, the stove with the dial plate, (referring to a sheet iron stove produced there in court;) that stove went into my possession. I bought it; this was in the winter of 1841 and 1842. I bought the stove; I did not buy the regulator; plaintiff refused to sell that, because he had not then obtained a
fol. 89. patent. The apparatus was attached to a cast iron frame and wound round this lever, and this rod worked in a fulcrum.

The pendulum was of sheet iron, and passed down inside of the stove. I got the stove into my house that winter. Mr. Foote made experiments with certain quantities of wood and with the thermometer, to ascertain how it would regulate the heat. It operated well at a high temperature, imperfectly at a low temperature. He used to come to my house to see it operate. At a high temperature it worked perfectly, but at other temperatures imperfectly. That stove had one
fol. 90. brass rod. The pendulum went into a pair of jaws attached to the regulator. I kept the stove about the year, and then got a new one. In the mean time Mr. Foote got his patent, in May, 1842, since which I have seen other stoves with regulators in operation. If the mechanical work was done well, they would work well. If the object was to regulate the heat of the stove by letting in or excluding the air, it worked well. It is a useful invention. I had one made in 1842. I used it two years and sold it. I saw it last winter; it
fol. 91. worked perfectly then.

Being cross examined by the defendants' counsel, this witness testified as follows:

In the first stove a wire was wound round the brass rod and frame; it did not work well. It was very imperfect; the pendulum was of sheet iron, so thin that it warped. I think it was in the winter of 1840 and 1841. It might have been in the spring. It worked well when heated high. The pendulum was on the inside. The pendulum could be adjusted by a screw to its place, but
fol. 92. so you could adjust it by your finger. There was a sheet-iron shield on the inside, in part to protect the pendulum from the wood falling towards it. If the pendulum wire kept on the inside, the shield would be necessary. The pendulum would be liable to be bent by the wood if it was not protected by the shield. If the shield were used, the apparatus would not be liable to be clogged by ashes. In the fall of 1842 had one that was more perfect; in that the pendulum was on the outside. It was
fol. 93. very nearly perfect. I have 2 of the same stoves now. Have used them since the fall of 1845. The usefulness of the invention consists, in the first place, in producing an uniform heat; secondly, it is a matter of great economy in fuel; and, thirdly, we can keep a fire night and day. As to the first stove, (the cast iron stove,) the one which Mr. Foote experimented on, I never saw one of those, except the one in Foote's room. So of the sheet iron stove,
fol. 94. with the pendulum on the inside. I never saw any of them made. In the fall of 1842, or winter of 1842 and 1843, I first saw Foote's stove with the pendulum on the outside. Russel made the regulators in 1842. I don't know whether he designed it. I saw him at work at them. I don't know that he made the invention. I live in Canandaigua now. John B. Norris bought the stove I sold. I have seen many of them in use and in shops for sale.
fol. 95. This witness, being further examined by the plaintiffs' counsel, testified:

The pendulum in the first sheet iron stove was very imperfect; nothing like those used when perfected. That was the stove plaintiff was experimenting on during the winter of 1841 and 1842. He spoke frequently of having the pendulum on the outside. The pendulum on the outside is made of wrought iron, harder and stronger than the sheet iron pendulum, and worked much better.

Ralph Summers, a witness for the plaintiff, testified as follows:

I reside at Auburn, N. Y.; my business is pattern making.
fol. 96. I have worked in machinery always. I worked for Mr. McClary. Washburn Race came to me to get up a regulator for a stove. I think it was about 3 years ago, at Seneca Falls. He first brought me a drawing on paper. He came to me to see if I could contrive a regulator for a stove. He came often every day. I was then at work at McClary's shop. Foote's regulators were made at that shop. Race was at the shop tinkering almost every day. He was not employed by McClary. He said considerable about
fol. 97. plaintiff's regulator. He thought that Foote could claim the expansive and contracting power of the rod, and we must get up something else. He proposed mercury, with a piston in a cylinder. I told him I thought it could not be packed so as to keep the mercury in the cylinder, and he gave that up. The talk between him and me was to get up a regulator that would answer as well as Foote's; and if he could do it without the expansion rod he would do it. Zinc was mentioned, but we thought it would melt. Race got up and
fol. 98. showed to me a plan of a wedge with 2 jaws instead of a lever to get up the motion. I made some patterns. The wedge was proposed to alter the form of Foote's apparatus; we did not calculate to use the rod. That was thrown out in the start. But it was found impossible to make a machine without the expanding rod. The rod was to draw the wedge back and push it forward by expansion and contraction. When he first spoke to me, he said he supposed Foote was entitled to the use of the rod, and we must get up
fol. 99. a regulator some other way, and proposed mercury; we concluded it could not be done. After that Race made another form, and showed me. I think it was the wedge. The next one was similar to that he now uses. I liked the plan. He said he thought Foote had no right to get the expansion of metal or steam patented. It was mentioned that this was similar to Foote's regulator. Something was said about my helping him get it up, and he would pay me well for it. He spoke to Cowing and Seymour to get them to try
fol. 100. the experiment of the wedge, and manufacture them. Seymour refused, and said it would infringe Foote's. Cowing said he would go into it. They cast one or two for an experiment. He, said McClary, had agreed to go into it. He said he had got Silsby and the rest of the firm to go on with it. That he had to give them a pretty good share of the patent. The firm was Downs, Silsby, Thompson and Wheeler. Henion was an agent for the firm, from what I heard him and them say. Henion said they would not have

fol. 101. got along as they had—they would not have sold as many regulators—if it hadn't been for him. I made the fallow boards and flasks for Silsby & Co. in September or October, 1846. I think 6 flasks were made, and 6 regulators could be cast in a flask at a heat. I left Seneca Falls in November, 1846, and went to Auburn. I knew they cast them after the flasks. They calculated to take off a heat every day, but they did not do it; they could get 36 in a heat generally; they could make, on an average, 100 or 150 a week. In the spring of 1847, Race told me their
fol. 102. business was improving. He said they had orders faster than they could supply them. They had, in the fall of 1846, ten or twelve men in the furnace manufacturing stoves and regulators. They had four or five in the finishing shop, two at the stove in fitting them up. They were engaged in making pump castings. They showed me several orders; Henion sent the orders. I heard him say he was the means of putting it through by selling the regulators.

Being cross examined by the defendants' counsel, the witness testified that the firm of the defendants had eight or ten men; he saw
fol. 103 them frequently; that there were six in the furnace making regulators, and other castings. He was certain the flasks contained six castings. But now he believed they were afterwards altered so as to hold only four, to make them lighter to handle. They cast the whole of the regulator, except the brass rod and the screws at the end. Sometimes there were more than six flasks moulded at a
fol. 104. time, and sometimes not so much. They took a heat off every day while I was there. Since I left, I have been there twice, and they were moulding the same. Race said they had as much as they could do to supply their orders. The expansion of metals is no new thing; attaching this to a stove was a new thing. I knew that brass or any other metal will expand with heat, and contract
fol. 105. with cold. Race said that Foote could not get expansion patented. It had been used before; that steam had been used, and metals; that he had as good a right to use it as Foote.

I told him I did not think Foote could get the expansion and contraction of metals patented. Race told me he had heard it had been used for regulating the draft about a steam engine; he told me he had heard about a coiled wire about a flue to regulate the smoke; this flue was the flue of a steam engine; that the expansion of metals
fol. 106. was used to regulate smoke or something about heat; he did not understand it then, nor I either; he said it was always known metals would expand; he said he had heard that there was some such thing that had been in use, an apparatus with the expansion of metals as a first moving power; that he didn't know what kind of an apparatus it must be; that it was used about the flue of a steam engine. I couldn't be certain whether this was said in the conversation about which I have before testified, or some other conversation.

Harvy Russell, a witness for the plaintiff, testified: I reside at Seneca Falls; I work at mechanical business some; I made stove

fol. 107. regulators for the plaintiff in the fall of 1842, and in the winter of 1843; I made one small affair with the pendulum on the inside, and only one; the brass rod was on the inside, and all the machinery was on the inside; I made others with the pendulum outside; I have made the damper at the bottom and at the top; when the damper was on the top the pendulum was laid on the top of the stove; I have made patterns partly for putting all the machinery out-
fol. 108. side except the expansion rod; if the machines were made right they worked well; if the apparatus was made well mechanically, it would do what was claimed; I own that stove, (pointing to a sheet iron stove produced by the plaintiff, which had the apparatus in the inside.) I have had it four or five years; I have used it for a stove to live by, the only stove in my sitting-room; the stove has worked well in regard to regulation; the apparatus in it is similar to this model; it has a brass rod lever and pendulum; the difference between having
fol. 109. the brass rod inside and having it outside, is, that the brass rod is affected quicker when on the inside; in the one case you have to heat the stove first; the principle is susceptible of being put into different forms; I have seen the defendants' regulator; the moving power in the defendants' is the same as in the plaintiff's; I call this, (moving the pendulum,) a lever; the damper is adjusted as a lever; there are two levers in the plaintiff's regulator; the use of the
fol. 110. lever is to give motion; the motive power is a rod in both; by the expansion and contraction of the brass rod they move the lever; two levers communicate the motion to the damper. In the defendants' one lever alone communicates the motion, and the damper is itself a lever; there is no difference in principle between the operation of the defendants' and that of the plaintiff's machine; the regulating part of plaintiff's machine secures durable heat; it is economical and valuable; it will regulate the heat; I can fill my stove with wood, set it at a given heat, and it will take care of itself night and day;
fol. 111. the machinery is durable. A year ago last spring my stove got injured in my moving; I then examined the machinery, and it did not appear to have been worn any; I made the regulator for sale on my own account, and for the privilege I paid Mr. Foote two dollars a piece for each regulator; I don't know of any other person paying him a price.

Being cross examined by the defendants' counsel, this witness testi-
fied as follows: I did not say I was a mechanic; my main busi-
fol. 112. ness has been milling business; I have worked at stoves some; I commenced in the fall of 1842; I was in it two winters; I worked at the regulators myself, and had a man that made stoves; I made only half a dozen the first year; the reason why I made no more was ill health, and it was a new thing. Seneca Falls, where I reside, is a village of two or three thousand people. The next year I made fifteen or twenty regulators; I cannot tell the cost of the regulators as I made them; it would sometimes take me two or three days to make one; the cost of making them was two dollars, exclusive of materials; the

fol. 113. stove sold for twelve or fifteen dollars; this price was too low; I could not sell them; late in the fall of 1842 I first saw a regulator with a pendulum on the outside of the stove. Burroughs brought it there; he was a machinist at Seneca Falls. The brass rod is fastened to an iron rod; what makes the motion is the expansion of the brass rod; this is attached to an iron rod; if both the brass and iron expanded alike, there would be no action; when the iron frame is dispensed with, the top of the stove served for the other metal, and
fol. 114. the different expansibility of the two metals causes the motion; a brass rod alone, except for the different expansibility of metals combined, would produce no power; there is no metal but what will expand; if both were of iron or of brass, it would not expand at all. Foote directed me to make the rod of brass; I consider Race's regulator to be on the same principle as Foote's; in Race's the damper is closed by the weight of the damper itself, by gravity; Foote's regulator will not open or close a damper without power; Race's
fol. 115. will close without power, by its own weight; in Foote's regulator the stove is operated upon by heat in the stove; Race's regulator outside is heated by the heat radiated from the stove, through an intervening medium; I never knew but one stove made of the old box stove form, (meaning the first one described in plaintiff's specification; the side way application of power to the damper in defendant's regulator, does not differ from that in Foote's box stove form; they are the same in principle; most stoves
fol. 116. have dampers at the apperture to receive the air; the damper there is called a register.

John W. Wheeler, a witness for the plaintiff, testified as follows: I was, in the fall of 1846, of the firm of Wheeler & Downs. The firm of W. Race & Company, in 1846 and 1847, consisted of John W. Wheeler, Abel Downs, Horace C. Silsby, Charles D. Thompson, and Washburn Race. The firm commenced making Race's regulators the last of August or first of September, 1846; they continued till March, 1847. Their manufactures would average thirty regulators at
fol. 117. a heat; they would average three heats a week. Wheeler & Downs cast for Race & Company; Henion was travelling agent for the firm to procure orders, and in selling stoves and regulators. Defendants manufactured stoves and put them up there; the stoves were of sheet iron, and cast-iron bottom and top; there was considerable demand for them. I don't recollect the first cost of the regulators; I think they cost from 30 to 40 cents; defendants sold them at two dollars each.

Being cross examined this witness testified: The Race regulators cost from 30 to 40 cents; they sold them for $2 00; from Septem-
fol. 118. ber to March, Henion did not travel a great deal; only one man was engaged moulding regulators; there was some other labor auxiliary; the same man that moulded poured iron into the moulds, or did other business. The forty cents included only cost and waste of material and labor. There were two or three weeks in February that not much work was done by the defendants towards finishing up the

regulators, but the casting continued as usual. Somers was in Wheeler & Downs' employ. Not many of Foote's stoves have been
fol. 119. used; only three or four in the town of Seneca Falls. I am a manufacturer of stoves; I heard that Foote's stove was manufactured by Russell; they were not manufactured at Seneca Falls by any body else.

Cyrus C. Dennis, a witness for the plaintiff, testified as follows: I have been engaged in building steam engines, machinery, and stoves; I have made mechanics my study for 19 years. I have examined Foote's regulator and Race's. I have examined Foote's specification; there would be no difficulty in making the regulator from the description; as a practical machinist, I could take the specification
fol. 120. and drawings and make a machine; I could make it from the specification or from the plates. The principle upon which it operates is this: This brass cylinder may be called the material operated upon by heat; this produces motion, which is communicated through compound levers to the pendulum which operates on the damper; it is, in effect, two levers besides the damper. The damper in Foote's stove is a third lever; the operation of the machine does not depend upon the less expansion of the iron; the expansion of
fol. 121. the iron only retards the motion; it depends upon the expansion and contraction of the brass rod. Suppose the brass rod were connected with a brick wall on the outside, the effect would be the same; it is not dependent on the different expansion of metals. If the rod was fixed to something firm outside, you would get the whole expansive power, where now you get only the difference of expansion. In Race's regulators the shutting of the damper depends absolutely on the expansion of the rod, although it shuts by its own gravity.
fol. 122. The article above the damper is a lever. The motion in this case is communicated by a system of levers, the same in principle as the plaintiff's; the number of levers used makes no difference in principle. The only difference between the two regulators is, that Foote's responds quickest, because it has more leverage. The machines operate substantially on the same principle, and substantially on the same combination; the only difference, in effect, resulting from having the rod inside and having it outside, is, that in the last case it is less sensitive. I have seen the model only of the box; it is the
fol. 123. same as the defendants' in principle, in application, and in combination. If Foote's stove is well made they operate perfectly. I paid Foote two dollars for each regulator I made; they cost one dollar and seventy-five cents to make. The different modes of constituting the fulcrum, whether by a pin or steelyard joint, is not matter of invention; it is not patentable. The regulators are very economical, in preventing only so much heat as is desired, and not wasting it by suffering its escape up the chimney. The effect of the regulator upon the durability of a stove is very great. The regulating of the
fol. 124. heat prevents the stove from burning out by overheating. The

benefit of the detaching principle in plaintiff's regulators, is, that it prevents the machinery from breaking.

Being cross examined this witness testified: There is no difference in principle between fixing the regulator outside instead of fixing it inside of the stove. The rod in Foote's specification is described as fixed to a stove, or a frame in a stove. There is nothing new about adjusting the system of levers; levers have been used for almost every thing.

fol. 125. There is nothing new in the use or combination of levers in Foote's machine. There is no mechanical power used without levers; the number, form, or combination of levers, does not alter the principle of their application. From a description of Foote's regulators in his specification, Foote's apparatus would not operate if the metal of the stove and the metal of the rod were identical. I do not recollect of seeing a regulator in any form before Foote's patent.

Thomas D. Burrill, a witness for the plaintiff, testified: I reside in

fol. 126. Geneva; my attention has been turned to the principle of machinery for 20 years; have been in the business of a foundry and machine shop; I have made steam engines and stoves. I have examined both plaintiff's and defendants' regulators; the motive power in both is the heat operating on the brass rod, expanding and contracting it, which motion is communicated to the damper by levers. I agree with the last witness, C. C. Dennis, in all respects; the principle of both regulators is the same; they are the same in principle and in operation. I have examined the plaintiff's specification

fol. 127. sufficient to be able to state, that any competent mechanic can make the thing from the description.

Being cross examined, this witness testified as follows: I have never sold any of Foote's stoves; I have seen them on sale; I never saw them in use; four or five years ago I saw them on sale; half a dozen of them.

William Clark, a witness for the plaintiff, testified as follows: In November, 1846, I accompanied Foote when he called on Silsby &

fol. 128. Thompson; he gave them notice that they were infringing his patent, and that he gave them this notice for the purpose of increasing his damages; he showed them the patent; Thompson took a copy, or part of a copy, of the specification; Foote told him that he understood they were preparing to go into the business of making his regulators; he said he should seek to recover special damages if they went on with the business; they replied, they did not consider they were infringing; they said they should go on; about the same time defendant, Downs, was in plaintiff's office, and plaintiff showed to him his patent, and told him the same he had said to Silsby and

fol. 129. Thompson; I served a declaration in March; Silsby told me to tell Foote he did not care a damn for his patent; that they should go on and increase their business; that they should contest the patent; some time during last May, I had a conversation with Downs;

Downs said they would not make a compromise with Foote; he needn't expect anything of that kind; they had the means to give him all the law he wanted; he said he had sold out his interest in the
fol. 130. concern, and made very well by it; they said they didn't consider the patent worth anything.

John B. Norris, a witness for the plaintiff, testified as follows: I reside at Canandaigua; I bought a stove of Davison in June, 1844, and have used it ever since; it works well, and is a great saving of fuel; I am a farmer; I have seen one other at Davison's, and one at Lapham's; it is no trouble or labor to keep up a fire in the stove; have used it in cold weather almost every day and night; I have seen
fol. 131. others in use.

Lafayette Collins, a witness for the plaintiff, testified as follows: I reside at Bloomfield; I have used four of these stoves for the last four years; I am a lawyer; those that are well made, and are in repair, operate well; they take less fuel; I manufactured 30 or 40 of them and sold them, and never heard any complaint of their operation; I have had one in use night and day for 4 years, and it oper-
fol. 132. ates as well now as when it was first put up; it is a great saving of wood; wood in one of them will last 24 hours; I generally fill mine twice in twenty-four hours; put in pine shavings, and they will burn an hour, and burn when they would not last five minutes in a common stove; one of my stoves warms three rooms; I usually fill it about 9 o'clock at night, and have an equal temperature all night and a warm room in the morning; I paid Foote two dollars a piece for the right to use the regulators; I made some; the
fol. 133. stoves cost me too much, but I should have made five or six dollars if I had received the pay for all I made; they are in very general use in Bloomfield; I sold 8 or 10 in this village.

Being cross examined this witness testified as follows: I discontinued making them in 1844 or 1845; I paid two dollars a piece for making the regulators, another to make the stoves, and I found the materials; I did not understand the business; I did not quit because the
fol. 134. stoves became less saleable; I had a great many applications for them after I quit the business; I lost money by the operation; two stoves did not work well.

Elbridge G. Lapham, a witness for the plaintiff, testified as follows: I reside at Canandaigua; I have two of Foote's regulators, and have used them 4 winters; mine regulate the heat perfectly; I don't know that I can tell accurately the proportion of fuel they require;
fol. 135. I once thought they would not take over a quarter as much fuel; I am satisfied they do not require over one-third as much as an ordinary stove; I have warmed three rooms with one of those stoves; I usually have burned about 5 cords of wood to warm those rooms; Parish, who occupied before me, used about 15 cords to warm one with a Franklin; the heat was kept equable, much like the temperature of a pleasant natural atmosphere; I have left my room for forty-eight hours, and found it warm on my return; can put wood

fol. 136. in my stove, and it will keep up an equal heat for 48 hours; the apparatus works as well now as when I began using it, and I think better; the one in my office I got second-hand; that I have used only three years; the great difficulty in other sheet-iron stoves is the sudden changes; in a cold day the regulator is almost constantly in motion; the opening of a door will affect the regulator instantly; you can put a single stick of green maple into it, and if it ignites
fol. 137. at all it will burn out; I have no doubt a fire can be kept in them for four days; there is no necessity of splitting the wood fine; you can burn anything of the size you can get into the door; a year ago last winter, the Race's regulator was brought here for sale; the first I saw was at an agricultural fair, in October, 1846; and my impression is, they have been kept in market from that time to March, 1847.

On cross examination this witness testified: I have seen a
fol. 138. large stick of maple or hickory charred through, forming a solid mass of live coal, without being consumed; I bought one of my stoves in 1843, the other in 1844; Foote's stoves were on sale here 4 or 5 years ago; I paid $16 for my stove.

Thomas I. Paine, a witness for the plaintiff, testified as follows: I reside at Seneca Falls; I have used plaintiff's regulator 4 winters; its operation is perfect; I agree with the other witnesses as to its
fol. 139. operation; I have used it 4 winters constantly; the fire does not go out all winter; it meets my highest expectation.

James H. Metcalf, a witness for the plaintiff, testified as follows: I live in Canandaigua; I have used Foote's regulator 2½ years in my office; it worked well; it regulated itself readily on slight changes of heat; in such a winter as last winter, it would save one-third of the fuel which such a stove would use without a regulator; kept a fire night and day; set the heat the temperature required, and it will
fol. 140. remain so without change.

Here the counsel for the plaintiff announced that they should call no more witnesses at present; thereupon the counsel for the defendants proposed to read in evidence the disclaimer, endorsed on the letters patent, not as a disclaimer, but as a confession that the invention was not new, and the patentee was not the original inventor of all that was claimed in his specification. The counsel for the plaintiff objected that the defendants were not entitled to read the same in evi-
fol. 141. dence; first, on the ground that they had caused it to be rejected when offered; and, secondly, that it must be read as a valid disclaimer, if at all; and, third, that the same purported to be only a copy, not in the handwriting of the plaintiff, and was not proved to have been executed by him. The counsel for the defendants insisted, nevertheless, that they were entitled to read the same as a confession, denying it to be valid as a disclaimer; and that, as it
fol. 142. was endorsed on the letters patent produced by the plaintiff, it was a part of the whole instrument, and might properly be read in evidence by the defendants to qualify or contradict the specifi-

cation; but the court decided that the plaintiff's objections were well taken, and refused to allow the said paper to be read in evidence.

To this decision and refusal the counsel for the defendants then and there excepted.

And here the counsel for the defendants moved the court,
fol. 143. and insisted, that the plaintiff should be nonsuited on the following grounds:

1. That the plaintiff disclaimed to recover, on the grounds of any infringement of the second and fourth things claimed in the summary of his specification, and had given no evidence of any infringement of those things; that the first claim, mentioned in the summary as hereinbefore set forth, was insufficient and invalid, because it was
fol. 144. a claim to an abstract principle, or to the application of a mere abstract principle to certain purposes, and not a claim for the invention of any mechanical structure or process by which such principle was applied.

2. That the third claim was for a combination only; and the plaintiff could not recover under that claim, because he had not shown an infringement of two essential parts of the combination, to wit, the process described for connecting and detaching the pendulum from the damper, and the mode of setting the heat of a stove at any
fol. 145. requisite degree, by which different degrees of expansion and contraction were requisite to open and close the damper of a stove; which two things the defendants' counsel insisted were essential parts of the combination, described in the third distinct claim, contained in the summary of claims in the specification.

3. And the counsel for the defendants further insisted, that the plaintiff ought to be nonsuited, on the further grounds that the specification of the plaintiff was insufficient in that it [did] not de-
fol. 146. scribe the plaintiff's invention as required by law; in that it did not show that the expanding rod must be of a metal of different proportional dilation from the metal of the frame, or of the stove, to which it was attached; nor did it give the requisite dimensions or proportions to enable a skilful mechanic to make a machine; and on the ground that it appeared that the defendants' regulator was not an infringement of the plaintiff's patent; that it was dif-
fol. 147. ferent in principle, because the expansive metal was put outside and not inside of the stove; because the expansive power was applied in the defendants' regulators only to open the damper by pulling and not to closing the damper by pushing, as in the plaintiff's; and that it was different in its combination of levers from the plaintiff's, in that its levers were adjusted with detached joints, while the plaintiff used fixed joints; and in this, that the defendants did not use the plaintiff's detached process at the damper, or his mode of
fol. 148. setting the regulator at a given degree of heat; and that, as a combination, it was different from the plaintiff's combination described in his specification; and that the defendants did not use the whole of the plaintiff's combination; that on inspection, and on the

evidence produced, the plaintiff had not shown an infringement so as to be entitled to put the defendants on a defence.

But the court then and there decided that the said plaintiff
fol. 149. should not be nonsuited. To this decision and refusal of the court to nonsuit the plaintiff, the counsel for the defendants then and there excepted, and the exception was then and there noted by the court.

The cause was then opened on the part of the defence by William A. Sackett, esq., of counsel for the defendants.

The defendants' counsel then offered to read in evidence certain portions, then and there specified, from a public work entitled "A Dictionary of Arts, Manufactures, and Mines, containing a
fol. 150. clear exposition of their principles and practice, by Andrew Ure, M. D., F. R. S., M. G. S., M. A. S., Lond.; M. Acad. N. S., Philadelphia; S. P. H. Soc. N. Germ. Hanov., A. W. S., J. J.," etc., etc. The volume produced bore an imprint as follows: Second edition, London; printed for Longman, Owen, Brown, Green & Longman, Pater Noster Row, 1840; and on the back it was labelled, Dr. Ure's Dictionary of Arts, Manufactures, &c.

The plaintiff's counsel objected to the reading of any part of this volume, on the ground that the title of the work was not cor-
fol. 151. rectly indicated in the notice of defence hereinbefore set forth; but the court decided that the same was sufficient in that respect. The counsel for the plaintiff further insisted, that no part of the said work should be read in evidence, because the said notice served on the plaintiff, and hereinbefore set forth, did not specify on what page, or under what title or head, in Ure's Dictionary, the material part of the invention was described.

2d. It did not specify what part of the invention was de-
fol. 152. scribed. The defendants' counsel insisted, that the notice was sufficiently definite and precise to enable them to read in evidence the articles now proposed to be read; but the court decided that the said notice was insufficient, and therefore excluded the defendants from reading the portions of the said work as proposed, or any part thereof. To this decision and exclusion the counsel for the defendants then and there excepted.

The defendants' counsel then offered to read in evidence
fol. 153. the same portions of the said work, under that part of the notice which stated that a material part of the said invention was known to Andrew Ure, of London; but the plaintiff's counsel objected to the same being read on that ground, and the court sustained the objection; to which decision the counsel for the defendants then and there excepted.

The articles proposed to be read were the article entitled "Thermostat," beginning on page 1237, and the article entitled "Heat Regulator," beginning on page 643, which articles may be read
fol. 154. from the book produced on the trial on any motion to be made in this bill of exception.

The counsel for the defendants then offered to prove by scientific mechanics, and by experts in mechanical science and art, that they knew the terms "Heat Regulator" and "Thermostat;" that they are terms in common use among mechanics and experts in mechanical science and arts, and that they could without difficulty of seeking information concerning heat regulators find in this dictionary the parts so proposed to be read without having any specific reference to the said portions of said volume. The defendants' counsel offered
fol. 155. this evidence for the purpose of renewing their motion to read the said specified portions of the said volume. But the court decided that the testimony offered would be inadmissible, and excluded the same; to which decision the counsel for the defendants then and there excepted.

The counsel for the plaintiff waived any objection to the reading of the book on the ground of want of evidence of its genuineness and the authenticity of its publication at the time and place of its date.

The counsel for the defendants now offered to read from the Journal of the Franklin Institute, volume IX, for 1832, an article
fol. 156. from page 130, entitled "For improvements in the combination of machinery for regulating heat;" and also from the same volume, page 283, an article entitled "On the 'Thermostat' or Heat Governor, a self acting physical apparatus for regulating temperature, constructed by Andrew Ure, M. D., F. R. S.;" and also an article in the same volume, page 93, entitled "Further observations for the consideration of the members composing the committee on the explosion of steam-engine boilers of the Franklin Institute;" and also an article from the same volume, commencing on page 406,
fol. 157. entitled "To Andrew Ure, county of Middlesex, doctor of medicine," &c., and insisted that they were entitled to read the same in evidence on the ground that notice thereof was given in the special pleas hereinbefore set forth, and which had been struck out as mentioned; but the plaintiff's counsel objected, and the court decided that the said articles could not be read in evidence on the ground that no sufficient legal notice thereof had been given, and
fol. 158. thereupon excluded the same; to this decision the counsel for the defendants then and there excepted.

The articles proposed to be read from the said "Journal of the Franklin Institute" may be read from the book produced on the trial on any motion to be made on this bill of exceptions.

The counsel for the defendants then offered to read in evidence an affidavit to be made by the defendants, their attorney and by their counsel, who only had charge of the case, showing that they had confidingly relied on the notice of matters to be given in defence so served
fol. 159. as aforesaid, as a fulfilment of the law, and sufficient in all respects to entitle the defendants to read the said portions of Ure's Dictionary in evidence, and that they were taken by surprise; and that the said evidence was material to their defence, and without it they could not safely proceed in the trial of this cause; and on this state

of the facts, the counsel for the defendants moved the court to withdraw a juror, and offered to pay the costs of this trial, and stipulated to go to trial at the next term.

The counsel for the plaintiff waived the necessity of such
fol. 160. affidavits; but insisted that, assuming the affidavits to be made to the extent thus offered, the motion to withdraw a juror ought not to be granted. The court, with the consent of the counsel, that the motion should be considered as if the affidavits proposed were actually submitted, and on examining the said portions of Ure's Dictionary, and of the Journal of the Franklin Institute proposed to be read, refused to grant the motion to withdraw a juror, and said that if such a power could be exercised by the court at all at the in-
fol. 161. stance of the defendant, it could only be done where it was clear that he must otherwise suffer gross injustice.

And, secondly, that even if the portions of Ure's Dictionary and of the Journal of the Franklin Institute, designated and now offered to be read, were read in evidence, it was by no means clear that they would constitute a defence; to this decision of the court the counsel for the defendants excepted.

John Maynard, a witness for the defendants, testified as follows: All
fol. 162. I can say is, my taste and fancy has run towards mechanics, and my attention has been turned to the subject; have read some books on the subject; have worked some in shops; I think I am acquainted with the philosophical principles of machines, theoretically more than practically; have seen and examined a copy of Foote's specification.

Question. Could a skilful mechanic construct Foote's machine from the specification and drawings?

Answer. The length of the brass rod is not given; it does not appear
fol. 163. by the specification that the machine operates by the principle of the different expansion of metals; you cannot ascertain from the specification the principle by which it operates, so as make one of the machines; I could not with certainty make a machine that would operate, that is to say, I might make one that would operate; or I might pursue the specification throughout and make a machine that would not operate, without violating or going contrary to any thing in the patent; it would depend on the combination of metals I might happen to use; if I happened to use the right combination
fol. 164. of metals it would operate; if I happened to use a wrong combination of metals it would not operate; the reason is this, that the specification no where states to the mechanic that the two parts of the machine, to wit, the frame part that sustains the brass rod, and the rod, if it be of brass, must have different degrees of dilatation with the same or equal changes of temperature.

As I understand the specification, the frame to which the end of the
fol. 165. rod is made fast, and which sustains it, they are in contact at one end and in close proximity, and are placed in the stove

where they are exposed to the same temperature; that being the constitution of the machine, it is necessary that they have different degrees of dilatation under the same temperature, or it would not work. The relative lengths of the brass rod and of the frame must be altered or changed when subjected to heat, or it would not work; because, if not, they would both be relatively of the same length.

For instance, if the frame were made of cast iron, and
fol. 166. the rod of sheet iron, it would *not* produce but little motion; and if it was multiplied up by levers it would produce a great strain. There is so little difference of expansion it would be impossible to get strength enough to support the strain, so much so that it would be impracticable. If the structure to which it was applied was of brass, then, if the body of the structure was the support, it would not work. The power of the leverage depends on the length of the rod; the shorter the rod, the more leverage it should have; that

is to say, the longer the lever should be, in the form of the
fol. 167. machine described. Secondly, in Foote's specification, the stove plate forms the frame; the same principle applies to that. The rod or pendulum in Foote's patent is directed to be put inside. In the specification it is not directed to be protected by a shield; according to that specification, it would be a useless machine, without an addition to it by way of protection. After an ingenious man had used the machine awhile, he would see the importance of a shield.

The multiplication of the lever is above 150; then the expan-
fol. 168. sion produced would be 150. I once made one; the multiplication was 150. The rod was a little shorter than the one shown here. As the rod is directed to be placed in the stove, a mechanic would need no direction not to make it longer than the stove, but he might make the lever too long, so as to upset the rod, and render the machine useless. It might subject the mechanic to a series of experiments, to know what length of rod would be necessary, and what the length of the short and long arms of the levers should be; that

is to say, it would be necessary to exercise invention. The
fol. 169. relative lengths of the long and short arms of the levers not being given, it would subject the mechanic to a series of experiments to ascertain them. The starting point of these experiments would be a knowledge that the principle by which the machine operates is the different dilatation of the metal of the rod and the metal of the frame. There is no scale of proportions on the drawings. I could

not tell, without having dividers, whether the drawings are
fol. 170. made on a scale or not. I could tell if I had a scale and dividers; I would not know the inventor's scale. Figure 2 in the drawing is a perspective, but whether it is one that gives true lengths or foreshortenings I cannot tell. The two different figures do not show the same leverage. In figure 3 the short arm of the lever is considerably shorter, proportionably, than the lever of fig. 2. The mechanic would get from these drawings contradictory information as to the lengths of the levers, if he should resort to the drawing. As I

view the drawings, they afford no correct information as to the proportionate lengths of the rod, and of the long and short
fol. 170½. arms of the lever. I should know nothing of the proper lengths and proportions from the specification and drawings, without actual knowledge of the machine. In this respect the artisan must resort to experiments; the shorter the short arm of the lever the greater the motion of the other end. The difficulty in the specification is, that no proportions are given in the specification or in the drawings, so as to know what motion to give. Excess of motion might be inconvenient, so as to throw the pendulum too far, and strain the machine; the fulcrum might be placed too near the end of the
fol. 171. lever, so as to produce an unnecessary and dangerous strain of the machine. In that case the pendulum, if inside, would strike the side of the stove; the amount of motion may be varied considerably without any injury to the operation; excess or extravagance either way might be injurious; if there was too little motion, the machine would not be sensitive; if there was too much, it would not work; it would destroy the useful effect if the motion was too small. There is nothing in the specification to show where the fulcrum
fol. 172. should be placed; the drawings give no information as to the difference of the two metals required. The mechanical difference between two machines is, first, the general mechanical difference of the location, and arrangement of the different parts of the two machines; they both move through the agency of a system of levers; the levers are different; the last lever in Race's operates on the damper very differently from that in Foote's; the damper in Race's
fol. 173. is formed into a lever of itself, whose fulcrum is on one side of the air orifice, and on one side of the damper itself. That is a difference which I call a difference of principle between the two machines, as that part of the invention; it operates upon a different principle, for this motion (in Race's) is not applicable to the motion for a rotary damper used in Foote's, so that the rest of this machinery applied to Foote's could not be usefully employed at all, neither could Foote's apparatus to this of Race's, and therefore I consider it a difference of principle. Another distinction between the two, is
fol. 174. the shape and construction of the first lever to which the brass rod is connected, or upon which it operates, in Races; the difference is this, that Race's is a bent lever, Foote's is a straight lever; in Race's it is a lever with a short arm, standing at right angles to a long one. The difference in the mode of connecting the brass rod with the short arm of the lever is this; in Foote's it is connected by a rivet or close joint, in Race's it is connected by barbs, or hooks, made upon each part. It is different, for the reason that Race's
fol. 175. two levers detach from each other, and in Foote's they are so constructed that neither can move without carrying the other with it. In Race's the short arm of the bent lever is a mere niche, filed in not more than ⅛ inch (where the hook operates); in

Foote's so short an arm cannot be got. This difference constitutes a difference in the leverage of the two machines. The difference in the damper is, that Foote's is a rotary damper, to which he attaches a lever, and Race's is a hinge damper. Foote's could not be
fol. 176. made to work on a hinge without an entire alteration of the machinery, and an entire new combination; and Race's machine could not operate on Foote's damper without an entire new combination, which would require the exercise of the inventive faculties. In Foote's machine, what he calls a rod, or brass rod, (if it must be of brass,) must have rigidity sufficiently stiff to resist the pressure occasioned by the turning of the damper, and moving of the lever, and parts connected with it; in Race's it is only necessary that the piece of brass, whatever it may be called, operate by pull-
fol. 177. ing; it may be a limber strip, and not a rod; it need have no rigidity; it may be flat; it may be a chain or slip so limber that it would not hold its own weight; $\frac{1}{4}$ of an inch of common width and ordinary thickness of sheet brass would operate Race's; that is to say, a strip of flat brass $\frac{1}{20}$ of an inch thick. A metallic rod is a piece of iron having considerable length in proportion to its diameter, and having solidity, and the diameter of it in its different cross sections is the same, or nearly so; it may be round or square. If the
fol. 178. diameter vary greatly, it becomes a strip or slip. The piece of brass used in Race's Regulator is not a rod. Taking Foote's machine, constructed on the principle described in the specification, a strip of brass, used in the place of the expanding brass rod, would not operate; except when it contracted, it would not open the damper. By different principle I mean that Foote's machine, in that particular respect, is a distinct thing; in that particular there is a difference of principle between the two machines. By difference of principle between the two machines, is meant
fol. 179. a difference in the particular mode of its combination or operation. I will take the verge watch and the lever watch for illustration. The motion of the train of wheels is communicated to the balance wheel on a different principle in the one from the other; in the common verge watch it is communicated by teeth upon two pallets, and turning the verge that carries the balance; in the other the motion is communicated to a single pin fastened to the verge, and therefore communicates motion both ways. This part of the watch
fol. 180. is called an escapement; the two escapements are essentially different in principle. The second great difference between Foote's regulator and Race's is in the principle of mechanical combination. First. Foote's is applicable to a rotary damper and to that alone. 2d. The levers are different in their shape and their mode of connexion. 3d. I consider it a difference in principle, that one pulls and the other pushes. I consider it like the old steam engine before Watts' improvement, which operated in one direction, and
fol. 181. was connected with the walking beam by means of a chain attached to the segment of a circle on the end of the walking

beam, and that only in one direction, so that the piston only pulled down the beam, but had no tendency to push it up. Watts introduced the double acting engine with a stiff rod, and pushed it up; the difference between these two machines is precisely similar. The valve in Race's descends by its own gravity. A further difference in the principle of the two machines is, that in Foote's the lever and the
fol. 182. rod are immoveably connected together. In Race's they are detached; in Race's the mode of altering or adjustment so as to set the stoves to a different degree of heat is not fixed. The alteration to set the machine at a given heat is effected by turning that screw which operates directly on the rod. In Foote's it is by fixing the lever by hand without a set screw. The same final result is produced, but in different ways. In Race's the way it is set is by lengthening or shortening the rod. In Foote's it is produced by setting the
fol. 183. pendulum. This constitutes a difference of combination. In Race's the rod has no capacity to push the valve down.

Question by the court. What parts of this apparatus (Foote's) are concerned in opening and closing the valve, and thereby regulating the heat?

Answer. As to the apparatus secondly described in the specification, all the parts are necessary except the index and index plate. The pendulum is concerned; it is what gives motion to the damper. The rotary damper is a necessary part of the machine to effect its purpose, without that in the combination the apparatus is ineffectual. The
fol. 184. detaching process in Foote's apparatus is used in effecting the regulation of heat; it would be necessary to have that or some other contrivance. In Race's there is no such thing; it is a necessary part to constitute the machine as described in the specification of Foote. The pendulum is not found in Race's machine; there is a lever which operates on the valve and effects the same purpose. The article called a pendulum in Foote's apparatus is a lever; that is its proper name in mechanics.

fol. 185. Question. What are the things, powers, or combination, which constitute the combination described in the third claim of Foote's summary in his specification by which the regulation of the heat of the stove or other structure is effected?

Answer. In the language of the third claim the combination of the whole apparatus is described. It includes the index and includes the whole; it includes the pendulum and the detachment process at the damper; because if you take that away the machine will be
fol. 186. liable to injury. By Foote's specification I could not find Race's machine; they are not alike; I cannot find the same combination. But I find parts of Foote's machine, that is to say, elements and things well known, which are in Race's, producing the same result of opening and closing a damper, but in different combination, and the end is effected in a different manner; the reason why the combination is different is, that the levers in Foote's are connected by pins

or rivets, so that one cannot move without the other; while
fol. 187. in Race's they are detached when moving one way, and are left free. Another difference in the combination is that the index pendulum and the detaching process of Foote's are not found in Race's, and the dampers are different as before described. The fastening of the rod and of the frame in Foote's machine is a necessary part of it. The power used in Foote's machine is the alteration of the lengths of the two metals, by reason of the different expansibility of the two metals. The two metals are absolutely necessary, that
fol. 188. is to say, two metals of different rates of dilatation.

This witness being cross examined by the counsel for the plaintiff, testified as follows: I drew a specification for Race; not this one; it was re-drawn; my impression is, that I called the brass slip a rod. I did not assist Race about the invention; I know that Race had been endeavoring to get up a regulator that should be a good one, and he showed me one, but that was already invented. I have been counsel for the defendants in this suit. I don't know whether the
fol. 189. ratio of expansion is affected by the size of the rod; a brass rod of whatever size would expand the same in length, I suppose, but I don't know; one effect of each of these regulators is the same, that is, to open and close the damper of a stove. In Foote's it is produced by expanding power, on a regulator; Foote uses a rock shaft, which forms a fulcrum; this pendulum may be called a lever or an arm extending from that rock shaft. The motion is communi-
fol. 190. cated from the expansion rod to the damper by leverage, or by means of levers.

Question. When the motion is communicated by means of levers, does it make any difference in principle whether the levers be crooked or straight?

Answer. I think it might make some, if you mean by crooked levers what I do. That is a lever; the one part of which stands at right angles to the other; the difference of connexion with the lever is not a difference in the elementary principle of the lever, but is a
fol. 191. difference in the principle of the combination, as to ascertaining what length of lever is required; it is to be ascertained by experiment, if you don't know the principle of the power; there might be considerable latitude as to the length of the lever and imparting power, and yet it would work well. But there are certain extremes beyond which it would not go; one of the grounds upon which I made my answer as to the difficulty of constructing the machine, was that I did not consider that the direction in the patent was to make the expansion rod of brass. I consider the direction in the specification
fol. 192. to be that any metal may be used for the rod which is convenient, and that brass is said to be the more practicable for convenience. Suppose the frame to be of wrought iron and the rod of refined steel, it would not operate; it would produce no motion. You could not produce an operative machine made by the same combination, if you attached the expanding rod to a brick wall.

The defendant's counsel here introduced and read in evidence the patent and the specification of Washburn Race, with the drawfol. 193. ings thereto annexed, which were, without the drawings, in the words and figures following, to wit:

No. 4,443.

The UNITED STATES OF AMERICA,

To all to whom these letters patent shall come:

Whereas Washburn Race, [of] Seneca Falls, New York, has alleged that he has invented a new and useful improvement in registers for stoves, which he states has not been known or used before his application; has made oath that he is a citizen of the United States; that he does verily believe that he is the original and first inventor or fol. 194. discover[er] of the said improvement, and that the same has not, to the best of his knowledge and belief, been previously known or used; has paid into the treasury of the United States the sum of thirty dollars, and presented a petition to the Commissioner of Patents, signifying a desire of obtaining an exclusive property in the said improvement, and praying that a patent may be granted for that purpose.

These are therefore to grant, according to law, to the said Washburn Race, his heirs, administrators, or assigns, for the term of fourfol. 195. teen years, from the fourth day of April, 1846, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, a description whereof is given in the words of the said Washburn Race in the schedule hereunto annexed, and is made a part of these presents.

In testimony whereof, I have caused these letters to be made patent, and the seal of the Patent office has been hereunto affixed. [L. S.] Given under my hand at the city of Washington, this fourth day of April, in the year of our Lord 1846, and of the independence of the United States of America the seventieth

fol. 196. N. P. TRIST,
Acting Secretary of State.

Countersigned and sealed with seal of the Patent office.
EDMUND BURKE,
Commissioner of Patents.

The schedule referred to in these letters patent, and making a part of the same.

To all whom it may concern:

Be it known that I, Washburn Race, of Seneca Falls, in the county of Seneca, and State of New York, have invented a new and improved apparatus for rendering the registers of stoves and other inclosed fire places self-acting, by the unequal contraction and expanfol. 197. sion of different metals by equal changes of the temperature, and I do hereby declare that the following is a full and exact description thereof:

The apparatus of my self-acting register is intended generally to be attached to the outside of the stove, but in contact therewith, or so near thereto as to be readily affected by the heat thereof, and is constructed as follows:

I have a plate of iron, wrought or cast, but I prefer cast iron, which I call the sustaining plate; this plate is from one to two feet in length, but for convenience sake, as well as for appearance, I make fol. 198. this plate, in length, equal to the height of the stove, and at or near the lower end it is enlarged in width, so as to contain and surround the air pole by a border or curb, upon which the register rests when closed, as hereinafter described. This sustaining plate may be of any thickness and shape which fancy or convenience may dictate, but the width of about one and a half inch, and thickness of one-fourth of an inch, is sufficient. In the back side of the sus- fol. 199. taining plate, or the side next to the stove, is a longitudinal groove, (the section of which may be rectangular, semi-circular, or any other convenient shape,) extending from within about a quarter of an inch from the top of the sustaining plate to the upper end of the vertical lever hereinafter mentioned. This groove is from one quarter of an inch to one inch in width, and from one quarter to one-half an inch in depth. In this groove a slip or rod of brass, fol. 200. which I call the expansion rod, is suspended by a screw, which I call the regulating screw, passing through the upper end of the sustaining plate into the groove above mentioned, and lapped into the upper end of the brass slip or rod, which is here enlarged in thickness for that purpose, by riveting thereto a short piece of iron or other metal of sufficient size to receive the screw; the head of the fol. 201. screw or collar thereon resting upon the top of the sustaining plate, to the lower end of the expansion rod is firmly fastened, by riveting or otherwise, a piece of iron or other hard metal, about one and a half inch in length, and half an inch in width and thickness; near the lower end of which, upon the front side, a sharp hook or barb is made pointing outward and upward, which hook or barb falls into the bottom of a niche cut in the upper end of a vertical lever fol. 202. of about two inches in length. The bottom of the niche in the vertical lever being about one eighth of an inch from its fulcrum, and in a line horizontal with the fulcrum. This fulcrum may be a small pin about one-twelfth of an inch in diameter, passing through the vertical lever, and through two projecting pieces or ears made for that purpose on the sustaining plate. It will be seen that this lever is in effect a lever bent at right angles, the larger end being vertical, and the shorter end horizontal, the fulcrum being in the fol. 203. angle. This lever moves backward and forward in a slot or mortice made through the sustaining plate. The register is a piece of metal, made plane and smooth upon its lower surface, and when closed, lies at an angle from a vertical sufficiently inclined to cause it to close by its own weight. From the upper part of the register a tail piece, or short lever projects upward and behind the lower end of

the vertical lever; in the back side of the tail piece, a niche is
fol. 204. cut, which fits upon an edge formed at the lower end of the slot or mortice in the sustaining plate above mentioned, so that the register is sustained by this edge, and turns upon it as a fulcrum or center; a small projection upon the inner side of the vertical lever, at or near its lower end, strikes the tail piece about one eighth of an inch above the edge aforesaid, so that when the expansion rod is contracted by cooling, the vertical lever is caused to press upon the tail piece of the register, and open it; and when the expansion rod becomes dilated by heat, the vertical lever will permit the register to close more or less by
fol. 205. its own weight, according to the degree of heat to which the expansion rod is subjected. To the screw in the upper end of the sustaining plate is attached an index, under which, and attached to the stove or the sustaining plate, is a circular index plate, marked as may be convenient, so that, by turning the screw, the register may be caused to open and close at any desired temperature. In order to render the register more sensitive, I sometimes make openings
fol. 206. quite through the sustaining plate along the whole, or nearly the whole, length of the expansion rod, thus exposing it to air in the room. The sustaining plate, with the expansion rod, vertical lever, and register connected with it, as above described, is fastened by screws or otherwise in a vertical position to the stove, so that the air hole in the sustaining plate shall coincide with a similar one in the stove, and it is then ready for use. And I do further declare, that I do occasionally dispense with the separate sustaining plate, and use
fol. 207. the plate forming the stove as a part thereof instead; and in such case I prefer placing the expansion rod upon the outside of the stove; it may, however, be placed inside the stove, with or without a separate sustaining plate; and, in order more clearly to describe my said invention, I have hereunto annexed drawings thereof as follows, viz: Fig. 1 is a front view of my said apparatus; A A is the sustaining plate; B, the expansion rod, seen through a longitudinal opening in the sustaining plate; C, the register, partly open, showing E, the
fol. 208. air hole through which the air passes into the stove; D, the head of the regulating screw; a, a, the index attached to the same screw; b, b, the index plate in section C, the vertical lever; d, the tail piece or register. Fig. 2 is a plan of the index and circular index plate. Fig. III is a longitudinal section of the whole apparatus as above described. A A is the sustaining plate; B, the expansion rod, which is semi-circular in its cross section, as shown in fig. 4;
fol. 209. C, the register partly open; D, the regulating screw; a, a, the index attached to the same; b, b, the index plate; c, c, short pieces of iron riveted to the ends of the expansion rod, into the upper end of which the regulating screw is lapped; at E, the lower piece of iron is fastened into a hook or barb, as shown at i; k is the vertical lever, having its fulcrum at C; at O, the hook attached to the lower end of the expansion rod falls into the bottom of the niche in the
fol. 210. vertical lever; M is the tail piece of the register, projecting be-

yond, upwards, and behind the lower end of the vertical lever—a niche being cut therein, which sustains the register upon the acute angle at M. The advantages of my said invention are, as I conceive, 1st, cheapness and simplicity in construction; 2d, certainty and regularity in its action; 3d, durability and not being liable to derangement. Having thus fully described the construction and operation of my improved and self-acting register for stoves or close fire places, what I
fol. 211. claim therein as new, and desire to secure by letters patent, is the manner in which I combine the expansion rod B with the register or valve C, by means of the lever K; the whole constructed and operating in the manner and for the purpose herein set forth, or in any manner substantially the same, by which the ordinary connecting joints are avoided.

WASHBURN RACE.

Witnesses—NELSON KLINE, W. J. MILLIKIN.

fol. 212. George H. McClary, a witness for the defendants, testified as follows: I reside at Seneca Falls; I have lived there eighteen years; my business is that of a founder and working in machinery; I am practically acquainted with that business; am acquainted with stove registers; I should think very few of Foote's regulators have been sold lately at Seneca Falls; I do not know of any being sold within the last 3 years: I have made some of these regulators through Mr. Foote's dictation; I made some regulators from Foote's plan three or four years ago; I sold some and broke up the rest.

Question. What are the constituent parts of the combina-
fol. 213. tion described in the specification by which the regulation of the heat is effected?

Answer. All the parts constituting the machine; the expansive rod; the lever; the tumbling rod or rock shaft; the pendulum and damper; the frame to which the expansion rod, the lever, and rock shaft are attached to the stove plate. To render it effective the expansive rod must be fastened at one end; the dial plate and detached lever are also necessary; they are included in the combination described in the third claim in the specification, in addition to what I have named; the pendulum is the detached lever.

fol. 214. Question. What parts of this (Foote's combination) are used in Race's regulators?

Answer. A rod of expansion, or contraction, or metal; I don't know of anything else in which they are alike; I don't know that there are any other parts of Foote's combination used in Race's regulator; I think that there is not any other; there is no rock shaft to connect the two levers in Race's as in Foote's; these two levers are detached; the rock shaft is necessary to Foote's machine; it would not work without it; the difference in the two regulators is first, in Race's, the
fol. 215. screw which attaches the expansion rod to the frame; again, Foote's damper is not used in Race's; in Race's the damper

is one of the levers of the machine; it operates by power on one side; it shuts itself by gravity; on the other hand, Foote's is a revolving damper, and opens and closes by moving power applied both ways; the process of imparting the power to the damper is to apply it on one side; this is a difference of principle; in regard to the pendulum, the difference is, that in Foote's the moving power is applied to close the damper, and is not applied so in Race's; there is no pen-
fol. 216. dulum in Race's; this is a difference of principle, and the combination is for a different purpose; there is a difference as to setting the lever to regulate the heat in Race's; it is done by a screw, and in the other it is not; the leverage is different in the two machines; Foote's is firm, and calculated to operate both ways; Race's are detached when not in action, and operate only one way; there is a difference in the principle of the rod; in Foote's it operates both ways, in Race's only one way; Foote uses the rod as a rod ne-
fol. 217. cessarily; in Race's it might be a slip.

I question whether I could make the machine from Foote's specification, for the reason that no proportional lengths are given; I could not calculate the leverage without experimenting; in the drawings there are different lengths of the same article; a particular direction to the mechanic to use brass is necessary; I should think that in the specification the principle of expansibility is confined to
fol. 218. one metal, not to different metals; I first saw Race's regulator in 1845, at my shop, a wooden pattern; Somers and I were together in the shop, and Race would sometimes come there and converse with us about getting up his regulator; I heard Race say he hoped he might get up a good deal better regulator than Foote's; I never heard Race say anything about getting round Foote's patent; he said he wanted to get up a better regulator; one that would suit the public better; be more simple, and could be put on the outside of the stove.

Being cross examined by the counsel for the plaintiff, this
fol. 219. witness testified as follows: The rock shaft operates as a fulcrum to a lever when the lever is fastened to it; the motion is communicated to the valve in both stoves by a lever; I put two apprentices at work at the Foote stove; the workmanship of those I manufactured was not bad; there was a defect in Foote's pattern furnished by him, and those made from that pattern were bad and lost; this was in 1844 and 1845; I have made some of Race's regulators; I
fol. 220. had no interest in the regulator business; my partner, Mr. Owen, was engaged in the business.

Andrew S. Pond, a witness for the defendants, testified as follows: I reside at Utica; I am a mechanic; I have a foundry and smelting works; have worked all my life in mechanics.

Question. What are the constituent parts of the combination by which the heat of the stove is regulated as described in the third claim in the summary of claims in Foote's specification?

Answer. If you mean the constituent parts that operate in opening and closing a damper, you take the whole of the parts
fol. 221. described; he has described them all to be used for that purpose; among them is a rock shaft; there is a damper plate, a dial plate, 4 levers combined with an expansive rod connecting with the rod; the levers are riveted together; a frame is in contact; the peculiarity of the machine is the peculiarity of the mode of communicating motion by the levers; the rock shaft is a lever; all means used to accelerate motion are levers; none of these constituent parts are found in precisely the same form in Race's regulators; the substan-
fol. 222. tial difference between the two regulators is in the connexions between the two; in that in Foote's the connexions are fast, fastened by a pin; in the other they are detached; the rock shaft is not found in Race's regulators; the absence of that is a difference in the form of the machinery; there is no material difference in principle in this; if the rock shaft were taken out of Foote's machine it would not operate; Foote's machine could not be made to operate on a valve like Race's; Race's could not upon Foote's; owing to the form of machinery in Foote's it is necessary to exert the same power
fol. 223. to close the damper that opens it; Race's, in consequence of loose and fast connexions, exerts its power in opening the valve, and not in closing it; rigidity of the rod in Foote's is essential; it is not essential in Race's; I call myself only an ordinary mechanic, but if Foote's specification had been presented to me by any one with a request to make a machine, I should have told him I thought I could; I might have failed to do so; I might have failed in consequence of the proportional lengths not being given; experiment there-
fol. 224. fore might have been necessary; the principle of the machine is not set forth in the specification why the machinery operates; a knowledge of the principle would be necessary; a knowledge derived from some source.

Being cross examined by the counsel for the plaintiff the witness testified as follows: Foote's regulator is operated by the expansion and contraction of the rod; so is Race's; the brass rod and the motive power are the same, and the motion is communicated to the damper by the expansion and contraction of the brass rod in both.

The counsel for the plaintiff put this question:

fol. 225. Is there any difference in principle between these two machines in these respects?

The counsel for the defendant objected to the question as improper, because the question ought to be limited to the difference of combination in principle. The court overruled the objection. The counsel for the defendants excepted to the decision, and the exception was noted.

Answer. In this respect there is a difference in the principle of its operation; one of them at the end performs a rotary motion, and the other a motion up and down; they are both constructed on the
fol. 226. moving principle of the expanding and contracting rod; there would be a difference in the principle of the final operation of

the two machines; there is not more than one mechanic out of ten could tell the difference of the expansion of different metals.

Timothy Dewey, a witness for the defendants, testified as follows:

I reside at Watertown. In 1823 I was in Europe, and traversed several countries in learning the mode of building gas works. I had previously paid much attention to mechanical studies. On my return, I constructed the gas works in New York, and managed them.

fol. 227. Question. Please state the difference between these two machines.

Answer. The term principle is not very well defined, but in mechanics it is applied to two machines, arriving at the same results by different arrangements of machinery. The difference between the two machines is, that Foote's acts by expansion and contraction both; Race's by contraction only. This is a difference of principle between the two machines. In Foote's the machinery which operates upon the damper is included within the stove. It cannot, in the na-

fol. 228. ture of things, be as promptly operated upon by the contracting power of the cold atmosphere as the other. In the other (Race's) the brass rod, being external, is more sensitive to contract than can possibly be done by the other. The means by which these results are arrived at are, in almost every particular, dissimilar. In my view of principles they are, in every respect, dissimilar. Foote's is acted upon by the principle of the well known law of expansion and contraction of metals, and by the combinations of this ma-

fol. 229. chine it has to push and pull. The other acts after once being set, (as both must be to a sufficient space to admit sufficient air;) after it has been set, the atmosphere operates upon the expansion rod; the intention being to create combustion to warm the room. It contracts the rod by its refrigerating power, and opening, by its expanding power, admits more atmosphere into the stove, and produces a greater amount of combustion. I may illustrate my idea of principle by the plough and the harrow. Both are intended to

fol. 230. pulverize the soil; but they are different in principle. So of the harp and accordion; vibrations of sound are produced by vibrations of air; the one has strings, the other metal. So of the various water wheels—the overshot, the undershot, and breast wheels; the overshot acting by gravity; the undershot by impulse of water under the wheel; and the breast wheel operating by an impulse on the middle of the wheel. These are different in principle. I see nothing in common between the two regulators as regards principle. No man living can take the specification of Foote's patent without

fol. 231. any other knowledge than it affords, and construct from it the machine described. There are no dimensions; no reference is made to a drawing with a scale of parts. It would be necessary for the mechanic to institute a great variety of experiments; the chances would be 1,000 to one that he would fail. He might make a machine, after a few trials, that would open and close a damper; but

as to making a machine like this, there is a very slight guide to conduct him to experiment. A good mechanic would get an
fol. 232. outline idea; but there is no scale in the drawings. He might make a machine like it. He might produce the same result through other machinery different from this.

Being cross examined by the counsel for the plaintiff, this witness testified, that, so far as the contraction of the rod is concerned, the the principle is the same in both. In Race's there must be expansion. The difference between the two is, that in Foote's the expansion makes the action; in Race's it permits the action. The motive power is the same in both. That power in both is communicated to the
fol. 233. damper by levers. A lever is a lever, whether long or short, according to my understanding of principle. When the mechanism is different, it is a difference of principle. There may be a difference in principle between two machines using the same power, operating in the same way, and producing the same result by different mechanism. There is no difference in the principle of the lever, whether it be bent or straight—not in the mere operation of the lever. No other power or implement is used in Foote's than the expansion of the rod and the lever. Race's lever might be applied to
fol. 234. Foote's damper by changing the direction in which it acts.

Being re-examined by the counsel for the defendants, this witness testified, that in the case supposed on his cross examination, of two machines using the same power, and producing the same result, by different mechanism, the same result would necessarily be produced in a different way.

Birdsall Holby, a witness for the defendants, testified as follows:

I live at Seneca Falls, and am a machinist. I am acquainted with Foote's and Race's regulators. There is a great difference between them in the amount of machinery. Foote's requires two
fol. 235. stirrup joints, connected with the expansion rod and first lever; there are three levers and one connecting rod; an arm fitted on a hollow shaft or cylinder within the rock shaft. On the outside of the shaft is fixed the index to set the regulator, and on the other the pendulum; and it requires a lever and a shaft to connect it with the pendulum. At the damper is a shaft, and on the inside is a lever. All the machinery I have described, that is used in Foote's machine, to carry the motion from the expansion rod to the damper, are necessary in the combination to work the opening and closing of the damper
fol. 236. by which the heat of the stove is regulated. In Race's only one lever is used to carry the motion from the expansion rod to the damper. As to the damper, Foote's consists of two plates, one stationary and the other moveable, and a lever and a shaft. Race's is a damper only. The application of power in Foote's is by a pendulum, which detaches; Race's does not detach. One pushes and pulls; the other pulls all the time. The expansion of the metal closes the damper in Foote's; in Race's it closes by its own weight. In
fol. 237. Race's, after the damper is closed, the rod passes by and

don't operate at all. In Foote's the lever continues in motion. Foote's levers are necessarily attached by firm joints, and stirrup joints, and wont work without being so fastened; Race's wont work if they are attached. Foote's combination cannot work Race's regulator. Race's cannot work Foote's regulator; it is impossible. In regard to setting the regulators at a certain degree of heat, in Foote's the machinery required are the shaft, the hollow shaft, and an arm fitted to the hollow shaft, the dial plate, and index, and lever, and a
fol. 238. thumb bolt. All these are necessary in Foote's construction. The index is necessary, because the pendulum is on the inside, and you cannot see it. Race's requires the knob at the top to take it by the hand. You turn that thumb knob by the screw. It draws up the rod directly. Race's is set by a screw; Foote's by a lever. In Foote's, the rod being on the inside, it must be protected, or it would not work at all. It requires a casting that would
fol. 239. cost more than Race's whole regulator, and of the thickness of half an inch, so as not to burn up. I think these differences are essential; they are differences in principle. The expansion rod in Race's is the thing that is nearest like any part of Foote's, and it requires nine times the expansible metal in Foote's that it does in Race's. Race's rod could not work Foote's regulator; Foote's might Race's, but it would not be so sensitive. You could not use either without the screw or apparatus to regulate the
fol. 240. heat. If there was not such a thing, the stove could not adapt itself to a change of heat. I have been a mechanic ten years. I have examined Foote's specification. I could not make Foote's regulator from his specification and drawings. First, I don't know how much heat the rod is exposed to; that is, how much the rod will expand. I don't know until I go to some scientific man, or some scientific work; then, having got that, say four inches
fol. 241. at the lever. I have only got two at the damper. The reason of this is, that there are two expansion rods—one of iron and the other of brass. I have then got to experiment to know the difference. I should have to make new patterns all through, and make the expansion rod twice as long. Then, as to the hollow shaft or cylinder, and its connexions, the drawings or specification do not explain, so that I would know how to make it. The next
fol. 242. difficulty is about the pendulum; it would go right into the wood in the stove, and would not work. I would have to make a sheath, and probably would make an experiment with sheet iron. This arm is called, in the description, a projection. It would be necessary to have proportions; you could not possibly make it right without.

Neither set of levers in the two machines respectively would work the other. If Race's were pinned together and the damper closed, it would double the expansion rod right up; in Foote's, if the least substance gets into Foote's, it breaks right up. In the other no harm would be done in that case.

fol. 243. Being cross examined, this witness testified as follows: I don't mean that the difference of the expansion rod alters the principle of the two machines; the bearing fulcrum and the pin fulcrum are both fulcrums. I have been in the defendant's employment about a month; I have not told Foote that the dampers were alike in principle. The three levers are, the damper, the pendulum, and the lever attached to the rod. I have seen one of Race's regulators with a rotary damper; that word principle I cannot understand
fol. 244. in any shape; I don't know but the machines are the same in principle; don't know as they are.

William Arnot, a witness for the defendants, testified as follows:

I have had one of Foote's first made stoves, and another directly afterwards; the first had a pendulum inside; it worked very well for a little time, and then failed; it was a cast iron stove. He said that the crack in the stove destroyed the principle, and was the cause of its failing to operate. The other worked well a little time; it was a sheet iron stove; the regulator was outside; the regulators have not been
fol. 245. used since; I could not use them with any certainty. My father's stove (which was one of Foote's) failed; four others failed in the Presbyterian church, in Seneca Falls; they were cast iron stoves, with the pendulum inside. This was in 1842.

John Maynard, the same witness before mentioned, being recalled, further testified as follows:

I committed a mistake, an error, in my former testimony, when I answered the question, that the index was not at all an essen-
fol. 246. tial thing, but a matter of convenience. I had then in my mind the kind of stoves that Mr. Foote had made, with the pendulum on the outside; but with the pendulum on the inside, the index is a necessary part of the apparatus. The temperature could not be changed without the index, and is, therefore, essential to the utility of the machine.

The brass expansion plate on the outside of Race's stove is more or less affected by external air, and would be affected beneficially
fol. 247. by the temperature of the room; for if the temperature of the room becomes reduced, the stove plate and rod would be affected, and would operate partially by the temperature of the room; it is a difference to the amount of this effect, an essential difference. Foote's, being on the inside, would move by being affected by the temperature of the stove alone; Race's, by being affected by the temperature of the room and of the stove. I found, on trial of Foote's stove with a pendulum on the inside and a shield, *I found* that
fol. 248. shield a very serious detriment to the heating power of the stove, and it being in the front of the stove, it was of more detriment than if it had been in any other part. I remedied it and put the pendulum outside, and found [that] it added to the heating power of the stove, and it became a better stove, independent of being a better regulator.

As to the index, the machinery would go on with its action if the

dial plate was not there, but its action would be detrimental if it was not set. The dial plate has nothing to do with the mechani-
fol. 249. cal action, but it has to do with the regulator. It would be a damage to dispense with it; it would be useless, or worse than useless, without it; so it would be the same if the setting process in Race's were dispensed with.

Edward J. Latham, a witness for the defendants, testified as follows:

I reside at Seneca Falls; I am a carpenter; am acquainted with Foote's regulator; I have a stove with Foote's square regulator in it; it has not worked to regulate the stove heat at all, as it should;
fol. 250. the damper was too tight; did not move easily; I have had it five years. I don't see a piece of the machinery in either of the regulators which could make it work if applied to the other. The brass in Race's comes nearest to the brass rod in Foote's of any thing, and there is not enough of that. As to constructing Foote's regulator from the specification and drawings, sizes and proportions would be necessary to work from; the levers in Race's are not fast, as
fol. 251. in Foote's; there is no such shaft; no such joints. The mode of setting the regulator is different in Race's; in Race's it is a setting screw; in Foote's a fast screw.

William Langworthy, a witness for the defendants, being duly sworn, testified as follows:

I reside in Seneca Falls; I am acquainted with Foote's regulators, and have sold them; in the fall of 1842 I sold the most of 25 cast iron stoves; the next year, 12 or 15; a number were returned to me as not good. I had one in use which worked well at first, but after-
fol. 252. wards seemed to lose its power, and I took out the regulator.

Andrew Church, jr., a witness for the defendants, testified as follows:

I reside at Canandaigua; have pursued various mechanical businesses, that of a carpenter and joiner, machinist in steam works. I carried on that business six or eight years; was always a mechanic. I have examined Foote's specification and drawings; I thought I could not make a machine from them, there being no dimensions; I call the
fol. 253. drawings imperfect; they have no size or dimensions. I have examined Race's patent; I should consider them different; the number of levers is largest in Foote's; he uses the expanding and contracting power to close and open; Race uses only contracting power to open the damper. In Foote's they have a connecting rod from the lever or shaft, to move the pendulum; there is neither connecting rod or pendulum in Race's. That connecting rod is essential in Foote's combination; it would not work without it. The index is essential on the outside; the pendulum outside is not essential. In Foote's there are three levers.

fol. 254. Being cross examined, this witness testified as follows:

I first read the specification a week ago; since that time I have read it to-day.

Francis Walter, a witness for the defendants, testified as follows:

I reside at Seneca Falls; am a tin and sheet iron worker; it costs half a dollar more to fix a stove to receive Foote's regulator, than to fix it without such purpose; it costs no more to fix a stove to receive Race's regulator than to make a common damper. A common
fol. 255. damper costs 18½ cents. Foote's stoves do not work very well; some of the regulators were made by McClary, and some of them by Fairchild; I did not examine them much; it was not my business to see whether they were well made; I never made one; never saw one in use; some may have worked well.

Miles P. Mack, a witness for the defendants, testified as follows:

I have worked at machinery for a couple of years considerable. I am acquainted with the regulators; they are very different;
fol. 256. heard Foote's specification read the other day; have never examined it myself. I thought it would be very difficult to make a stove from Foote's description, because no dimensions or proportions were given; there are three or four levers in Foote's, only one in Race's. There is a connecting rod in Foote's, none in Race's. The expansive power is used both ways in both directions in Foote's. In Race's it is used only one way. There is a rock shaft or lever
fol. 257. in Foote's, there is nothing corresponding to this in the other. The construction is different in Race's from Foote's, in this, that Race's employs detached levers, which are absent in the other. The one combination cannot be used in the other stove.

George H. McClary, being recalled by the defendants, testified as follows:

If the pendulum be on the outside it is a shaft. The combination set forth in Foote's specification cannot be used if the pendulum is made outside. Therefore, there is an essential difference in the construction when the pendulum is placed outside from what is
fol. 258. found when it is inside. The index described in Foote's specification is necessary when the pendulum is outside. A set screw is necessary when the pendulum is inside. This makes a change in the combination. I could not take the same machinery prescribed in the specification and construct a regulator with the pendulum on the outside.

Cyrus C. Dennis, the witness before mentioned, was recalled by the counsel for the plaintiff, and testified as follows:

The first regulator described in Foote's specification, I have
fol. 259. no doubt, I could make from the specification, without the drawings. I say now that I could make the second regulator described from the drawings without the specification; but it might be difficult to make it from the specification without the drawings. I don't consider the dimensions of much importance in making such things; no exact proportions are required in Foote's regulator. They are very much altered by different mechanics, and in different stoves. The small lever in defendants' regulator is a rock shaft, to all intents and
fol. 260. purposes. A rock shaft is one that rocks backwards and forwards, and the levers are often cast on them. If we are to

be nice and critical the expansion rod in defendants' machine is also a connecting rod. One-half of it communicates the motion of the other to the lever, so that defendants have a connecting rod, 2 levers, 3 steel-yard joints, and a rock-shaft. The lever that operates on the damper is a rock shaft, in the strictest sense of the term. It performs the office of both lever and rock shaft. I have known several cast-iron stoves to fail from cracking so much that the damper would not control the heat.

fol. 261. Being cross examined this witness testified as follows: The fulcrum is the centre of motion; it holds the lever still at that point; levers are introduced into all machinery to increase motion, although the machinery of levers is infinitely variable. Foote has no steel-yard joints in his specification. The two regulators are unlike in that respect. A rock shaft is a shaft rocking back and forth. It is a part of the lever. Race's damper falls by the consent of the expanding rod.

Here the testimony on the part of the plaintiff was closed.

fol. 262. The cause was summed up by the counsel for the respective parties.

The defendants' counsel thereupon prayed the court to charge the jury:

1st. That in regard to the question whether the plaintiff's specification is sufficient, they must find for the defendants, if according to the weight of evidence it appears that a mechanic of ordinary skill could not with reasonable accuracy make a machine from the description, without invention and without scientific experiment.

2d. That the plaintiff's patent is for a combination only, and

fol. 263. that if the defendants do not use all the constituent parts of the combination described in the plaintiff's specification, the plaintiff cannot recover.

3d. That it is erroneous to consider as constituent parts of that combination only those parts which are requisite to the opening or closing the damper of a stove, or even those parts only which are employed in opening or closing the damper of a stove or other structure; but the jury must consider as constituent parts all the parts of the

fol. 264. machine as described in the specification by which the regulation of the heat of a stove or other structure is effected.

4th. That the index is a constituent part of the combination patented by the plaintiff.

5th. That the detaching process of the lever is a constituent part of the combination patented by the plaintiff.

6th. That the pendulum is a constituent part of the combination patented by the plaintiff.

7th. That if the defendants do not use all the constituent parts of the combination patented by the plaintiff, a verdict must be found for the defendants.

8th. That inasmuch as it is admitted that the defendants

fol. 265. do not use the index, the defendants are entitled to a verdict.

9th. That inasmuch as it is admitted that the defendants do not use the detaching process of the lever and damper, the defendants are entitled to a verdict.

10th. That if the defendants' machine is different in mechanical action, producing its results in a different way from the plaintiff's, this is a difference in principle which entitles the defendants to a verdict.

11th. That the use of the self-detaching lever by the defen-
fol. 266. dants instead of fixed levers, is a difference in mechanical principle.

12th. That the use by the defendants of an elastic slip of brass, which operates upon the damper only by contraction, instead of a rigid rod of brass, which operates by pushing and pulling, is a difference in mechanical principle.

13th. That the difference in the modes of setting the regulators of the two stoves is a difference in mechanical principle, and entitles the defendants to a verdict.

14th. That the placing by the defendants of the regulator,
fol. 267. and especially of the metallic part expanded outside of the stove, is a difference in principle from the apparatus of the plaintiff, which is inside of the stove.

15th. That the damages which a patentee can recover are only so much as he has lost by the action of the defendants.

The plaintiff's counsel prayed the court to instruct the jury, as matter of law, that the third claim in the plaintiff's specification, so far as it is a claim of a combination, is a claim of the combination of such of the mechanism described as is necessary to the opening and clos-
fol. 268. ing of the damper; that unless the rest of the mechanism appears from the evidence to be necessary to perform that office, it is not necessarily a part of the combination claimed.

And thereupon the judge charged the jury, that the claim set forth by the plaintiff in the first article of the summary at the close of his specification, being for the application of a natural property of metals to the purpose therein mentioned, was not a fit subject for a patent.

As to the first proposition contained in the defendants' prayer
fol. 269. for instructions, the judge charged in accordance therewith, and submitted the question of fact to the jury.

As to the 2d, 3d, 4th, 5th, 6th, and 7th of the instructions prayed for by the defendants, the judge charged the jury, that it was true as insisted by the defendants' counsel, that the third article of the summary of the plaintiff's specification, on which alone, if at all, he was entitled to recover, was for a combination; and unless it appeared by the evidence that the defendants had used all the parts of the plaintiff's stove embraced in such combination, he was not entitled to recover.
fol. 270. That the combination claimed in the article in question was of such parts of the mechanism described in the specification as are necessary to regulate the heat of the stove. And unless it appeared by the evidence that some parts of the mechanism not shown to have been used by the defendants were necessary to perform that office, or that

according to the just construction of the specification, such parts were intended to be claimed by the plaintiff as a part of such combina-
fol. 271. tion, they were not to be considered as embraced within it.

That inasmuch as by the fourth article of the plaintiff's summary he made a distinct and separate claim to what had been called the detaching apparatus, there seemed to be good reason to infer that it was not his intention to claim this in the third article as a part of the combination therein mentioned. But the judge observed, that the question relative to the extent of the combination, had been treated by the defendants' counsel as a question of fact, and he had no disposition to
fol. 272. withdraw it from the consideration of the jury; and he therefore submitted it to the jury to decide from the evidence, whether the parts of the mechanism described in the specification, which were not shown to have been used by the defendants, were necessary to regulate the heat of the stove; and instructed the jury that if they should so find the defendants would be entitled to a verdict. And the judge refused to charge otherwise in relation to such instructions or any of them.

To this charge and refusal of the judge, as to the 2d, 3d,
fol. 273. 4th, 5th, 6th, and 7th, of the instructions prayed by the defendants, the defendants' counsel then and there excepted.

As to the 8th and 9th propositions of the defendants, the judge refused to charge any otherwise than as he had charged in regard to the 2d and 7th propositions; to which refusal of the judge the counsel for the defendants then and there excepted.

As to the 10th, 11th, 12th, 13th, and 14th, of the instructions prayed by the defendants, the judge charged the jury that it was a question for them to decide upon the evidence, whether the machine
fol. 274. or machinery used by the defendants for their regulator, was the same in principle as that of the plaintiff; and instructed them that a mere difference in form or size was not a difference in principle; that a new application of known mechanical power was in regard to inventions a new principle. And the judge refused to charge otherwise in relation to such instructions or any of them.

To this charge and refusal of the judge as to the 10th, 11th,
fol. 275. 12th, 13th, and 14th, of the instructions prayed by the defendants, the defendants' counsel then and there excepted.

As to the 15th of the instructions prayed by the defendants, the judge charged substantially as therein requested, and instructed the jury that the question of damages was exclusively with them; that if they were of opinion that the defendants had unlawfully infringed the plaintiff's patent, they ought to award to him such sum as in their judg-
fol. 276. ments, founded upon the evidence in the case, would fully indemnify him for the actual damages he had suffered by reason of such infringements beyond the taxable costs to which he may by law be entitled.

To this charge of the judge, as to the 15th of the instructions prayed

by the defendants, the counsel for the defendants then and there excepted.

The jury rendered a verdict in favor of the plaintiff of fifteen hundred dollars.

And because none of the said exceptions, so offered and
fol. 277. made to the opinions, and decisions, and charges, and refusals to charge, of the said court, do appear upon the record of the said trial; thereupon, on the prayer of the said defendants by their said counsel, the said judge, the hon. Alfred Conkling, who alone held the said court on the occasion of the said trial, hath to this bill of ex-
fol. 278. ceptions put his seal according to the statute, in such case made and provided, this 28th day of June, one thousand eight hundred and forty-eight.

ALFRED CONKLING. [L. S.]

HORACE C. SILSBY and others ads. ELISHA FOOTE. } In vacation, March 19th, 1850.

The motion for a new trial in this cause, came on to be heard before Judge Nelson, at his chambers in Cooperstown, on the 21st day of August, 1849, and after arguments by counsel for the respective parties, and due deliberation being had thereon; it is hereby ordered that said motion be denied with costs.

IN THE SUPREME COURT OF THE UNITED STATES.

HORACE C. SILSBY, WASHBURN RACE, ABEL DOWNS, HENRY HENION, and CHARLES D. THOMPSON, plaintiffs in error,
vs.
ELISHA FOOTE, defendant in error.

In error to the circuit court of the United States, for the northern district of New York.

Of the term of December, in the year of our Lord one thousand eight hundred and fifty.

Afterwards, to wit, on the day of December, in this same term, before the justices of the Supreme Court of the United States, come the said Horace C. Silsby, Washburn Race, Abel Downs, Henry Henion, and Charles D. Thompson, plaintiffs in error, by William H. Seward, their attorney, and say, that in the record and proceedings aforesaid, and also in giving the judgment aforesaid, there is manifest error in this, to wit, that, by the record aforesaid, it appears that the judgment aforesaid, in form aforesaid given, was given for the said Elisha Foote, defendant in error, against the said Horace C. Silsby, Washburn Race, Abel Downs, Henry Henion, and Charles D. Thompson, plaintiffs in error; whereas by the law of the land the said judgment ought to have been given for the said Horace C. Silsby, Washburn Race, Abel Downs, Henry

Henion, and Charles D. Thompson, plaintiffs in error, against the said Elisha Foote, defendant in error. And the said Horace C. Silsby, Washburn Race, Abel Downs, Henry Henion, and Charles D. Thompson, plaintiffs in error, pray that the judgment aforesaid, for the error aforesaid, and other errors in the record and proceedings aforesaid, may be reversed, annulled, and altogether held for nothing, and that they may be restored to all things which they have lost by occasion of the said judgment, &c.

Attorney for plaintiffs in error.